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Item No. 14.1.3
Halifax Regional Council
December 11, 2018

TO: Mayor Savage and Members of Halifax Regional Council

SUBMITTED BY: Original Signed by
Jacques Dubé, Chief Administrative Officer

DATE: 30 November 2018

SUBJECT: Halifax Regional Fire & Emergency – Operational Review

ORIGIN

On March 31, 2015 Regional Council moved a motion to direct staff to return to Council with a revised Fire Service Delivery Target and Administrative Order 24 following further detailed analysis of the 2006 Service Delivery Standard.

LEGISLATIVE AUTHORITY

The Halifax Regional Municipality Charter Section 307 provides Regional Council with the authority to make policies respecting full-time, volunteer and composite fire departments and emergency service providers in the Municipality:

307 (1) The Council may make policies respecting full-time, volunteer and composite fire departments and emergency service providers in the Municipality.
(2) Policies for fire departments and emergency service providers may include
(a) requirements and procedures for registration;
(b) personnel policies with respect to those members who are employees of the Municipality;
(c) the manner of accounting to the Council for the use of funds provided by the Municipality;
(d) an annual meeting to report to the public respecting fire and emergency services;
(e) such other matters as are necessary and expedient for the provision of emergency services in the Municipality.
(3) The Council may require proof of compliance with its policies before advancing any funds. 2008, c. 39, s. 307.

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RECOMMENDATION

It is recommended that Halifax Regional Council:

1. Adopt proposed Administrative Order 2018-OP-006 Respecting Fire & Emergency Service in the Halifax Regional Municipality, including repealing Administrative Order 24 as set out in Attachment 2.

2. Accept the proposed "Emergency Response Time Targets" as described in Attachment 3 as the desired response time targets to be implemented by Halifax Regional Fire & Emergency (HRFE) over a multi-year period subject to funding.

3. Direct HRFE to develop a multi-year strategy for implementation of the Emergency Response Time Targets in accordance with the Business Planning and Budget cycles as outlined in the discussion section of this report.

4. Authorize and direct staff to prepare a business case including financial implications for consideration in the 2019/20 & 2020/21 business plan and budget proposal to increase career staffing at fire station 45 (Fall River) from 0700-1730 Monday through Friday to 24 hours per day, 7 days per week coverage utilizing a Quint apparatus to address increasing community risk and provide response resources appropriate to the area of the Halifax International Airport.

BACKGROUND

In February of 2006, Regional Council accepted the document "Service Delivery Standards for Halifax Regional Fire & Emergency Service" as the desired level of service to be implemented over a multi-year period for the delivery of fire and emergency services to the citizens of the Halifax Regional Municipality by HRFE.

In July of 2013 the National Fire Protection Association (NFPA) published a revised edition of Standard 1720 "Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments".

In March of 2015, Regional Council directed staff to return to Council with a revised Fire Service Delivery Target and Administrative Order 24 following further detailed analysis of the 2006 Service Delivery Standard.

In September of 2015 the NFPA published a revised edition of Standard 1710 "Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments".

In January of 2017, HRFE received a "Fire Protection Services Study" from the Fire Underwriters Survey (OPTA Municipal Consulting Services) which includes recommendations relevant to Administrative Order 24 and HRFE service delivery targets.

In December of 2018, HRFE received a "Review of Administrative Order 24 and Halifax Fire and Emergency Service Delivery Levels Standards of Response – 2006" (attachment #1) from Pomax Consulting Inc. (the "Pomax report") which includes recommendations relevant to Administrative Order 24 and HRFE emergency response time targets.

DISCUSSION

HRFE Service Delivery Model

HRFE continues to be committed to provide highly cost-effective firefighting and rescue services to HRM. A major factor in HRFE's ability to do so is the composite service delivery model which comprises both career and volunteer firefighters. This model allows HRFE to provide all services described in Administrative Order 24 across the region effectively and efficiently. In their 2017 report, Municipal Benchmarking Network Canada (MBNC) reported HRFE's total fire cost per staffed in-service vehicle hour to be $66. This compares to the MBNC median in 2017 of $318. Much of this is attributable to the composite service delivery model.

Pomax Report 2018

In 2017 HRM procured Pomax Consulting to independently evaluate HRFE's expected services, service levels, and performance as defined in Administrative Order 24, and its ability to meet standards delineated in the "Service Delivery Standards for Halifax Regional Fire & Emergency" (2006). The Pomax report makes recommendations regarding:

- Administrative Order # 24 and the 2006 "Service Delivery Standard"
- Participation in federally funded Heavy Urban Search & Rescue (HUSAR) program
- Training of firefighters and other members
- Performance Monitoring and Analysis
- Emergency Response Time Targets:
    - Alarm Handling (Call Taking & Dispatch)
    - Turnout Times for Firefighters
    - Response Times (travel times) for first arriving fire apparatus
    - Response Times (travel times) for multiple unit response in urban fire protection districts
- Special Circumstances around the Halifax International Airport

Administrative Order 24

Administrative Order 24 was approved in 2001. Since that time the coordination of Municipal Emergency Management has been assigned to HRFE.

The proposed Administrative Order 2018-OP-006 Respecting Fire & Emergency Service in the Halifax Regional Municipality included in this report is intended to allow:

- Updates to terminology and naming conventions,
- Addition of language describing HRFE's responsibility for Emergency Management Coordination,
- Addition of language describing HRFE's responsibility for the Local Assistant to the Fire Marshall with respect to inspections, investigations and code enforcement.
- Removal of language describing registration of fire departments independent of HRFE, and
- Revisions to the minimum service levels and types provided by HRFE.

The proposed changes align with the Halifax Regional Municipality Charter, NS Fire Safety Act and the NS Emergency Measures Act. The changes also align with HRM Bylaws E-100 and F-100.

Recommended HRFE Emergency Response Time Targets

This report recommends response time targets for HRFE's response to structure fire emergencies and medical emergencies. HRFE's proposed goal is to respond within these time targets, 90% of the time. These time targets are expressed in seconds. Urban fire response districts include those with a population of 100 persons per square kilometer or more. A comparison of the proposed targets to other comparators is provided for reference.

		HRM 2006	NFPA 1710	NFPA 1720	Pomax	Proposed HRM 2018
Dispatch Time Time from receipt of alarm to notification of Firefighters.	Structure Fires and Medical Emergencies	60	64	64	90	90
Turnout Time Time from notification to the start of travel to the emergency scene with fire apparatus.	**Structure Fire Emergencies**					
	Urban Career	60	80	90	90[1]	90
	Urban Volunteer	--	--	--	--	360
	Rural Career	60	80	90	90[1]	90
	Rural Volunteer	360	--	--	360	360
	Medical Emergencies					
	Urban Career	60	60	60	90[1]	60
	Urban Volunteer	--	--	--	--	360
	Rural Career	60	60	60	60	60
	Rural Volunteer	360	--	--	360	360
Travel Time Time from start of travel of fire apparatus to arrival at the emergency scene.	Urban Career	300	240	--	300	300
	Urban Volunteer	300	--	--	300	300
	Rural Career	600	240	--	600	600
	Rural Volunteer	600	--	--	600	600
1st Alarm	Urban Career	480[2]	480[3]	N/A	480[2]	480[4]

[1] To be phased in over 3 years (Pomax report).
[2] Total of 12 Firefighters.
[3] Total of 15 Firefighters (single family home including aerial operations)
[4] Total of 14 Firefighters.
-- denotes item not specified.

Moving toward these targets would require an implementation strategy with enhanced data collection and reporting, improved collaboration with Integrated Emergency Services (IES) and ongoing training and education of firefighters and other staff. This process would span multiple years. As response time data becomes more reliable and available, staff might identify future opportunities for improvement that would be included in ongoing business planning.

HRFE has realigned its organizational structure to include a Performance & Safety branch. This branch is developing key performance indicators for the service. Approved Emergency Response Time Targets would be included in these performance measures. HRFE and HRM Information and Communications Technology (ICT) are implementing technology for more reliable data collection, including Automated Vehicle Location devices and Mobile Data Terminals. Using these tools and working in collaboration with IES and ICT, HRFE would collect data and report results on emergency response time targets as a part of ongoing business planning.

HRFE and IES are working toward a Service Level Agreement which will support data collection and improved overall response times. HRFE and ICT are collaborating to ensure that response time data is collected and stored in the HRM data warehouse, as well as developing near real time "dashboard" reporting for response time results. HRFE has partnered with the Dalhousie School of Engineering to study current turnout times, assess the factors which influence those times and recommend process changes to improve performance. The multi-year implementation strategy would identify and track initiatives such as these which will support enhanced decision making around emergency response time targets.

The multi-year implementation strategy would define the performance indicators which HRFE would report, based on the emergency response time targets, identify the data points that would be collected, outline the methods by which that data would be collected, stored and reported and describe how results would be reported. Over time, analysis of the data would allow recommendations to be included in future business plans.

Examples of possible recommendations include:

- location of types of fire apparatus (Engines, Tankers, Quints & Aerials)
- location and design features of future fire stations,
- traffic management methods (preemptive control of intersections, traffic calming, etc.),
- specifications of future fire apparatus (maneuverability, tools & equipment, setting capacity, etc.),
- infrastructure in developing communities (water supply for firefighting, road access to structures, and
- adjustments to the response time targets and confidence intervals as HRFE capabilities are better understood.

Special Circumstances around the Halifax International Airport

In their 2017 report, the Fire Underwriters Survey (FUS) noted that the high level of risk at and near the Halifax International Airport is due to the presence of large commercial buildings with higher required fire flows. They recommended the relocation of fire station 47 and noted that "…*A new, adequately located fire station which is equipped with not less than an Aerial apparatus and Pumper with two four person, full time crews would significantly improve the fire insurance grades for this area*…"

In their 2018 report, Pomax recommended increased staffing at fire station # 45 while investigating future opportunities with the Halifax International Airport Authority:
" … in the interim, evaluate the staffing levels at station 45 in the community of Fall River, including response to the airport area; for example, composite staffing of four career firefighters 24 hours a day at station 45 supported by an adequate cadre of volunteers would provide fire suppression protection to the airport area…"

Fire response district 45 (Fall River) has a population density greater than 100 persons per square kilometer (210.52 as measured in 2012) and is the only such district which is not currently staffed with career crews on a 24 hour per day basis. Adding staffing to fire station 45 would improve response to the airport and surrounding area after 17:30 (Monday to Friday) and on weekends and holidays through the combination of volunteer and career firefighters.

The addition of a Quint apparatus, which includes a 75-foot aerial ladder, would add increased firefighting capacity appropriate to large commercial structures around the airport and industrial park.

These changes would enhance protection in the community of Fall River and adjoining districts. This community is experiencing significant growth and increasing population. There are planned developments including facilities for vulnerable populations projected soon.

These increased resources would also be able to work proactively in fire safety and community risk reduction activities including fire safety maintenance inspections of residential and commercial buildings and public education regarding structure fire and wildfire risk reduction.

Additional Considerations

The allocation of volunteer and career firefighting resources requires continual evaluation and adjustment as community circumstances evolve. Selecting the appropriate mix is dependent upon numerous factors including population density, number and type of calls for emergency service and community risk profiles. Risk profiles consider building types and concentration, geography, transportation routes, industry types and demographics. HRFE continues to monitor all fire protection districts in terms of population density, community risk and call volumes.

The Pomax report found that the current HRFE staffing model is adequate for an initial response travel time for structure fires as outlined in the 2006 council approved response time standard. However, the 2006 standard of a 5-minute travel time is 25% higher than the NFPA 1710 standard of 4 minutes. Pomax further identified that trying to meet the NFPA 1710 standard for would be prohibitively expensive as many the current core stations would have to be relocated.

The Pomax report also found that HRFE was unable to achieve an effective firefighting force (1st Alarm) as outlined in the 2006 standard. However, their findings did not account for the addition of a crewed aerial on the Dartmouth side of the Halifax Harbour, nor the volunteers added to the core stations. NFPA 1710 and the Pomax report both identified 14 firefighters as an effective firefighting force for a single-family dwelling. However, NFPA 1710 also outlines the effective firefighting force with upwards of 36 firefighters required to address risks associated with larger scale events such as high-rise fires and large industrial complex fires.

The Pomax report findings support the decision to add more firefighting capacity to the urban core with 4 firefighters per Engine, additional volunteers in the core and a crewed aerial on the Dartmouth side of the harbour in relation to establishing an effective firefighting force. Any reduction of HRFE resources would reduce the ability to provide a timely and effective firefighting force and would be contrary to contractual obligations.

FINANCIAL IMPLICATIONS

Costs associated with the approval of recommendation # 1 can be accommodated within the current operating budget and anticipated 2-year operating budget. Most proposed services are already being delivered to the specified levels. Costs associated with urban search & rescue services will be offset by federal funding for the HUSAR program.

Approval of recommendations # 2 & # 3 will have no immediate financial implications. Over a multi-year period, HRFE will report on performance versus targets. If recommended strategies to improve performance targets are identified which have financial implications, these will be brought forward as a part of regular budget & business planning.

Approval of recommendation # 4 will have no immediate financial implications. A business case, including financial implications, would be prepared and brought forward in the 2019/20 & 2020/21 HRFE Budget and Business Plan to increase career staffing at fire station 45 (Fall River) from 0700-1730 Monday through Friday to 24 hours per day, 7 days per week coverage.

RISK CONSIDERATION

There are no significant risks associated with the recommendations in this report. The risks considered rate low. To reach this conclusion, consideration was given to operational risks.

Risks associated with not increasing resources in the area if fire station 45 (Fall River) would be identified in the proposed business case.

COMMUNITY ENGAGEMENT

Results of the 2018 Citizen Survey were reviewed regarding HRFE performance. Most respondents who answered question PS14 indicated that they were satisfied (44.6%) or very satisfied (53.3%) with the services provided by HRFE. Most respondents who answered question PS15 indicated that they were confident (52.4%) or completely confident (40.4%) that HRFE would respond to emergency calls in a timely manner. The recommendations included in this report are intended to maintain the trust that HRM Citizens have in their fire service.

ENVIRONMENTAL IMPLICATIONS

Implications not identified.

ALTERNATIVES

Regional Council may choose not to approve some or all of these recommendations in this report. This alternative is not recommended.

ATTACHMENTS

Attachment 1 – Review of Administrative Order 24 and Halifax Fire and Emergency Service Delivery Levels Standards of Response – 2006" (Pomax Report)

Attachment 2 – Proposed Administrative Order 2018-OP-006 Respecting Fire & Emergency Service in the Halifax Regional Municipality with Proposed HRFE Service Delivery Target

Attachment 3 – "Proposed HRFE Emergency Response Time Targets

Attachment 4 – Halifax Regional Fire & Emergency Service Delivery Levels – Standard of Response (February 16, 2006)

A copy of this report can be obtained online at halifax.ca or by contacting the Office of the Municipal Clerk at 902.490.4210.

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FINAL REPORT

Halifax Regional Municipality

Review of:

Administrative Order 24 and

Halifax Fire and Emergency Service Delivery Levels Standards of Response - 2006

December 3, 2018

POMAX CONSULTING

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Executive Summary

Beginning in 2012, Halifax Regional Fire & Emergency (HRFE) performed a full operational and service review of their business unit. The resulting report presented several recommendations and options for reconfiguring fire services and mapping the next steps to bring together the necessary resources to ensure appropriate levels of fire coverage within Halifax Regional Municipality. The report laid the groundwork for moving ahead with changes intended to result in better business intelligence and an improved capacity to make informed choices about how best to meet the needs of the municipality.

During the operational and service review, it became apparent that the service delivery standards set out in the 2006 Council Report titled *Service Delivery Standards for Halifax Regional Fire & Emergency*, which defines the functions and responsibilities of Halifax Regional Fire & Emergency, required further review and revision.

Halifax Regional Municipality engaged Pomax Consulting to independently evaluate Halifax Regional Fire & Emergency's expected services and levels, and performance as defined in *Administrative Order Number 24, Respecting Fire and Emergency Service in Halifax Regional Municipality*, and its ability to meet standards delineated in the *Service Delivery Standards for Halifax Regional Fire & Emergency*. Included in the objectives was developing target recommendations regarding types and levels of response for urban, suburban, and rural areas of the municipality based on acceptable risk, population density, service offering, performance measurements, and jurisdictional scans. A further objective was proposing revisions to service delivery targets.

The 2006 service delivery standards are summarized in Table 1 below (reproduced from Section 1.3). Pertinent terminology is defined in the text box following the table.

Table 1: Summary of 2006 HRFE Service Delivery Standards

A	**Fire protection districts with population density over 100 persons per square kilometre**
1	A dispatch time of 60 seconds, 90% of the time
2	A turnout time of 60 seconds, 90% of the time
3	A response time of 5 minutes or less, 90% of the time, for single unit responses, or for the first arriving unit of a multiple unit response regardless of the nature of the emergency service to be provided
4	A response time of 8 minutes or less, 90% of the time, for subsequent arriving units of a multiple unit response or alarm assignment dispatched with the first arriving apparatus
5	A full alarm assignment consists of 2 engines, 1 aerial, 1 tactical unit, for a total of 12 personnel
6	An Incident Safety Officer and a dedicated Incident Commander will be dispatched on full alarm assignments, with no response time criteria
7	A subsequent alarm assignment consists of a minimum of 2 units (configuration acceptable to the Incident Commander) for a total of 8 additional personnel
B	**Fire protection districts with population density under 100 persons per square kilometre**
1	A dispatch time of 60 seconds, 90% of the time
2	Staff turnout (when career staff are on duty): A turnout time of 60 seconds, 90% of the time Volunteer turnout: A turnout time of 6 minutes or less, 90% of the time
3	A response time of 10 minutes or less for the first arriving apparatus, 90% of the time

Incident: A call for assistance from a member of the public, or another emergency service or utility.

Dispatch Time: The elapsed time from the moment when the first call for assistance (alarm) is received to the time firefighters are notified to respond.

Turnout Time: The time interval from the moment firefighters are notified to respond, to the time when the dispatch centre is notified that the apparatus (fire vehicle) is en route.

Response Time: The time from firefighter notification to the dispatch centre that apparatus is en route, to the time firefighters notify the dispatch centre that they are at the incident.

Key Findings

The review revealed the following key findings:

- The *Service Delivery Standards for Halifax Regional Fire & Emergency* encompass all emergency response types, whereas other often-referenced standards from the National Fire Protection Association (NFPA) address response times specific to structure fires and special operations, and the provision of emergency medical services.
- Halifax Regional Fire & Emergency is not meeting the response time criteria stated within the 2006 Standards when applied to all emergency response types, but it is meeting the standard for initial travel time by a single fire truck to structure fires in both urban and rural areas.
- The current model of integrated dispatch (fire and police) is not effectively meeting the data collection or quality assurance needs of Halifax Regional Fire & Emergency.
- The emergency service types and levels authorized by Administrative Order Number 24 may not accurately reflect services being provided, or that should be provided, due to the diverse risks throughout the region and the varying needs of communities.
- A survey distributed as a component of this study to fire departments of similar-sized communities across Canada confirms that municipalities have to determine service types and response standards specific to the risks and needs of their service area.
- Recommendations from prior reviews, which were intended to ensure accurate and consistent data collection, either have not been implemented or have a pace of implementation more gradual than intended by the consultants. This affects data efficacy and confidence.

The study methodology involved

- a thorough review of pertinent legislation;
- examination of industry standards and practices;
- ongoing consultation with the steering committee;
- rigorous analysis of historical incident data;
- a review of previously completed studies in relation to Halifax Regional Fire & Emergency; and
- a comparative survey of similar jurisdictions (Appendix A).

Comparative Jurisdictions Survey

A requirement of the assignment was to develop target recommendations regarding the acceptable types and levels of response for urban, suburban, and rural areas of the municipality based on acceptable risk, population density, levels of response, service offering, performance measurements, and jurisdictional

scans. The scope of the assignment included an industry standards and best practices review. To assist with achieving these objectives, a survey of similar jurisdictions was carried out.

It is important to remain aware that municipalities which may appear similar can have very different fire risks and therefore different fire protection needs, which determine the services, standards, and resource allocation specific to each community. Variables may include

- demographics,
- age of buildings and fire load,
- terrain, which affects response,
- street patterns and speed,
- building use (commercial, residential, industrial),
- industry type, and
- suppression systems such as commercial and residential sprinklers.

Comparing HRFE's response standards and statistics with those reported by other communities provides some information about performance in relation to peer municipalities.

- Sixteen municipal fire departments were asked to provide information for comparative purposes:
  - 15 opened the survey, and 11 responded.
- Of the 11 responses,
  - 3 answered only the type of department, and
  - 1 completed only the first five questions.
- Seven fire departments, including Halifax Regional Fire & Emergency, substantially completed the survey. Results are provided in Appendix A.

Overall, the survey responses confirm there are minimal demographic or operational similarities between the communities. The survey did not reveal similar response practices to the extent that they could assist in recommending objective targets that can be used by Halifax Regional Fire & Emergency. The survey responses do confirm that municipalities have to determine standards and targets that are specific to their service area.

Service Delivery Standards

The 2006 service delivery standards are intended to encompass the services outlined in Halifax Regional Municipality Administrative Order Number 24. However, when read carefully, and the references related to the service standards and administrative order appendices are followed, Administrative Order Number 24 and the Service Level Standards are not mutually supporting, and a large part of the Administrative Order addresses a fire service organizational model that has not been in place for many years.

Our review revealed that the service types and levels listed in the two documents do not accurately reflect the current services being provided. Also, differences in, or the application of, service levels and definitions within the two documents may cause misunderstanding. The current level of service provision, as depicted in HRFE's response to the comparable jurisdictions survey, is not reflective of Administrative

Order Number 24 and the Service Delivery Standards, which could be interpreted as Halifax Regional Fire & Emergency not being authorized by council to conduct the level of service currently being provided.

This lack of clarity and coordination between the two documents may negatively affect the Halifax Regional Municipality in the event that legal action is taken against the municipality because of a response or activity by Halifax Regional Fire & Emergency.

We recommend combining and updating the documents to reflect the current organization and service delivery of Halifax Regional Fire & Emergency.

Search and Rescue Capability (Section 3.3 of the report)

Halifax Regional Fire & Emergency is in a unique geographical and service provision situation in that it is the largest municipality in Nova Scotia and New Brunswick and exists in a relatively isolated geographical location. This limits timely assistance to HRFE, from other agencies, in the event of a major or technically complicated emergency. Additionally, HRFE may be requested to aid other communities in Nova Scotia. In a separate project, Pomax conducted a review of Nova Scotia's fire services on behalf of the Union of Nova Scotia Municipalities and the Association of Municipal Administrators, and was informed by a number of fire departments that they expected HRFE would assist with major or technical emergencies, not only as part of mutual aid but also with technical rescue expertise. However, much of that rescue expertise, expected by other departments, has not been developed in Halifax due to funding limitations.

During an earlier phase of this assignment, when the comparative fire department survey was being completed, the federal government was evaluating its role in the support and funding of urban search and rescue, particularly in Halifax and Montreal. We understand that the federal government has committed to a reinstatement of funding and support for Heavy Urban Search and Rescue (HUSAR) capabilities across Canada, which will include new support for Halifax Regional Fire & Emergency to develop an enhanced HUSAR capability.

The 2016 federal budget provided $3.1 million annually and ongoing to establish the HUSAR Program as part of the Government's commitment to build safer and more resilient communities. Federal investments will be targeted toward specific HUSAR initiatives or projects on a cost-shared ratio of 75% (federal) and 25% (provincial/other).

Halifax Regional Municipality should make use of this funding to the full extent available.

Meeting the 2006 Standards (Section 4 of the report)

A requirement of this study is to "Evaluate HRFE's performance and ability to meet standards as defined in *Service Delivery Standards for Halifax Regional Fire & Emergency Service* (2006)." Section 4 of this report addresses the swiftness with which HRFE can, or should, arrive at various incident types in order to deliver service and expertise.

The task was to be accomplished through an analysis of response trends over three to five years. However, the historical incident data, particularly for earlier years, have numerous errors (detailed in Section 4) that

result in inaccuracies. Therefore, only 2016 and 2017 incident data were considered somewhat acceptable for statistics analysis.

The availability of consistently captured, reliable statistical data is critical to accurate performance measurement. This has been a long-standing concern for Halifax Regional Fire & Emergency.

- A fire dispatching operational review conducted by Pomax (March 2015), identified the requirements of an optimum dispatch system for Halifax Regional Fire & Emergency. Recommendations from the *Fire Dispatching Operational Review* report, which can be found in Appendix C of this report, included implementing a quality management program (Appendix C #13), and making a number of technological and process changes, all of which contribute to the ability to collect accurate incident data.
- In relation to establishing the 2006 service delivery standards, the report to council titled *Service Delivery Standards for Halifax Regional Fire & Emergency*, approved in 2006, states that "15% of the data, which was suspect, was eliminated from the final analysis."
- Data reliability has been a chronic problem.

A fundamental function of any dispatch service is accurate record keeping upon which decision making can be based. There are few indications that the Integrated Emergency Services (IES) and Halifax Regional Fire & Emergency are making progress in implementing previously recommended enhancements and quality control measures, and there may be several reasons for apparent lack of evolvement. For example,

- some recommendations may not have been accepted;
- funding may not be available;
- there may be more pressing regional or IES priorities; or
- resources may not be available within IES or HRFE.

Detailed analyses of HRFE's response performance by station level and component of response can be found in Section 4 of the report. Exhibit 13, below, reproduced from Section 4, offers a summary of the dispatch and firefighter response performance, in core districts, in relation to the applicable 2006 Standard.

Red text identifies those standards which are **not** met; white text identifies those standards that are achieved. HRFE is able to achieve the 2006 Standards requirement only for the first arriving apparatus to structure fire incidents. Most other performance falls short of the 2006 Standards by a wide margin.

Within this report, statistical information is provided for

- the core fire districts and stations—specifically, districts and stations 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18; and
- for rural districts and stations—specifically, districts and stations 11, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 33, 34, 35, 36, 38, 39, 40, 41, 42, 43, 45, 47, 48, 50, 52, 54, 55, 56, 58, 60, 63, and 65.

It is important to note that stations 45 and 58 are included in the rural district list of stations yet serve population areas with densities much greater than 100 persons per square kilometre, even though some of the response area is rural (please see Table 1). However, stations 45 and 58 are composite fire stations, which means that they are staffed by a combination of career firefighters supported by volunteers. Therefore, those stations, for the purpose of response time and other calculations, have been included with rural stations. The 2006 Standards references response and performance criteria for those occasions when career staff are on duty at composite stations, and we have applied those standards where appropriate.

Station 11, although staffed on a 24-hour basis with 2 personnel, is included as a rural district with a population density of fewer than 100 persons per square kilometre.

Finally, on occasion, stations 45 and 58 may be referred to as being within a group of stations or districts serving population densities of fewer than 100 persons per square kilometre. It should be clear that population densities within districts 45 and 58 are much greater, but they might be included in that category

- for the purpose of defining performance, and
- whether stations meet standards, and
- because they are composite stations.

Exhibit 13: Summary Information Core Districts

Districts and Stations 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18				
	2006 Standards			
	Incident Begin to Dispatch	Turnout	Response Time	Multiple Unit Response
	60 seconds or less, 90% of the time	60 seconds or less, 90% of the time	5 minutes (300 seconds) or less, 90% of the time	8 minutes (480 seconds) or less, 90% of the time
Performance 2016	141	170	367	682
Performance 2017	135	171	362	685
	Structure Fires Only, in Seconds, 90% of the time			
Performance 2016	145	173	286	570
Performance 2017	111	172	289	615

Exhibit 14, below, also reproduced from Section 4 of the report, demonstrates the dispatch and firefighter response performance, in rural districts, in relation to the applicable 2006 Standard.

Red text identifies those standards that are **not** met; white text identifies those standards that are achieved. HRFE is able to achieve the 2006 Standards requirement only for the first arriving apparatus to structure fire incidents and only when career staff are on duty. Most other performance falls short of the 2006 Standards by a wide margin, although volunteers came close to achieving the response time target in 2017.

Exhibit 14: Summary Information Rural Districts

Districts and Stations 11, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 33, 34, 35, 36, 38, 39, 40, 41, 42, 43, 45, 47, 48, 50, 52, 54, 55, 56, 58, 60, 63, and 65							
2006 Standards							
	Incident Begin to Dispatch	Turnout			Response Time		
		Career Staff	Volunteers	Career and Volunteer	Career Staff	Volunteers	Career and Volunteer
	60 seconds or less	60 seconds or less	Six minutes (360 seconds) or less, 90% of the time		10 minutes (600 seconds) or less, 90% of the time	10 minutes (600 seconds) or less, 90% of the time	10 minutes (600 seconds) or less, 90% of the time
Performance 2016	174	178	462	421	556	671	730
Performance 2017	188	183	468	433	549	624	695

In general, the 2006 performance standards are not met **except** in the circumstance of first unit travel time (response) to structure fires in the core districts and career response in non-core districts served by composite staff.

Most apparent are the protracted times for the Incident Begin Time to Time Dispatched at the dispatch centre and firefighter turnout time. We recommend that Halifax Regional Fire & Emergency process map both of these components to determine the cause of these apparent delays in reacting to emergencies.

Change Implementation, Performance Measurement, and Standards (Section 5 of the report)

As identified throughout this report, recommended changes to HRFE's service delivery criteria are based on several factors, including measuring performance against the 2006 service delivery standards (Section 3.2). However, we are not confident that the 2016–2017 data are sufficiently precise, which may affect performance measurement accuracy. One reason for this is the combined function of the IES.

Examining and explaining the issues and challenges of functioning within a combined police–fire communications centre is outside the scope of this assignment, and most observers would not understand the differences between police and fire call taking, or the dispatch handover process. This dual call-taker role is made more complex in this case because IES staff also function as 9-1-1 call takers—so it is actually a triple call taking role. Each call taking and dispatch phase (please see Exhibit 2: NFPA Cascade of Events) is supposed to be marked with electronic time stamps initiated by call takers and dispatchers, but indications are that it is not unusual for these time stamps to be missed. No matter how conscientious call takers and dispatchers are, it is very difficult to change roles "on the fly" between being a 9-1-1 call taker, fire call taker, and police call taker, plus remember to capture all the time markers. Subsequently, many are missed.

Our experience, based on multiple projects at consolidated communications centres in Canada and the United States, is that combining unlike communication centres such as police, fire, and—in some cases—emergency medical services (EMS) is often unsuccessful because of the disparate nature of each of these emergency services. Amalgamating like dispatch centres (police with police, fire with fire, etc.) is reasonable and usually has a very quick payback period and continuing cost savings. That isn't the case when combining unlike centres, such as Halifax's, because of operational and administrative challenges.

Recommendations and Associated Commentary

Our recommendations follow below, along with the report section in which they can be found.

Recommendation	Report Section
Update Administrative Order Number 24 and the Service Delivery Standard to reflect the current organization and service delivery of Halifax Regional Fire & Emergency.	3.2
1. Replace Administrative Order Number 24 (some of the content is no longer applicable to the Halifax Regional Municipality) and the Service Delivery Standards with a single, comprehensive order that represents the circumstances of the municipality including a) detailed authorization of emergency service types and levels, as shown in Table 4; b) assigning responsibility for fire prevention and public education activities that will be undertaken by the fire department; c) that HRFE follow best practices and annually review services and call types to identify gaps and opportunities for improvement for service delivery and mutual aid, automatic aid, and fee for service strategies; d) training HRFE firefighters to the awareness level for services provided by third-party suppliers; e) continually reviewing the frequency of responses being delivered by third-party suppliers for cost effectiveness; and f) detailed definitions of the service types to ensure consistent, accurate tracking of response types by the fire department and third-party service providers.	3.4
2. Halifax Regional Fire & Emergency should apply for funds and participate in the federal HUSAR initiative to provide response capabilities to the regional municipality, surrounding communities, and nationally as needed.	3.4
3. Upon approval by council of the service types and levels to be delivered to the community, Halifax Regional Fire & Emergency should engage in a Systematic Approach to Training (SAT) that includes the following: a) Analyzing (task analysis) the fire service's training needs compared to NFPA standards, such as ▪ Firefighter 1001 Level I & II	3.4

▪ Fire Officer – all levels ▪ Pre-Incident Planning ▪ Specialty services such as NFPA 1006 Auto Extrication, Confined Space Rescue, etc. ▪ HAZMAT NFPA 472 ▪ Public Education ▪ Fire Prevention ▪ Fire Investigation b) Designing the required training strategies (human resources, props, courses, methodologies, etc.) c) Physically implementing training across the entire department in a coordinated fashion d) Evaluating and validating the training that is delivered against the needs and circumstances of the region e) Revising the fire service training on a regular basis to ensure the task analysis is current	

Meeting the 2006 Standards (Comments Related to Section 4 of the report)

In general, the 2006 performance standards are not met **except** in the circumstances of first unit travel time (response) to structure fires in the core districts and career response in non-core districts served by composite staff.

Most apparent are the protracted times for the Incident Begin Time to Time Dispatched at the dispatch centre and firefighter turnout time. We recommend that Halifax Regional Fire & Emergency process map both these components to determine the cause of these apparent delays in reacting to emergencies.

In almost all discussions relating to fire protection, NFPA Standards 1710 and 1720 are considered. Appendix F: NFPA 1710 and 1720 Deployment Charts lays out incident descriptions, response criteria, and staffing levels within different scenarios. However, NFPA 1710 and 1720 are not statutory, and most municipalities regard them as targets. Those municipalities in Canada that do meet them would be exceptions. Appendix A: Comparative Jurisdictions Survey supports this conclusion.

Even though NFPA 1710 and 1720 address many aspects of fire safety and response, they are mostly discussed within the context of travel time—for example, in an initial response under 1710, a) the percentage within which four firefighters can arrive on scene inside 4 minutes travel time, or b) 14 firefighters can arrive within 8 minutes. These standards are predicated on research, such as that completed by the National Institute of Standards and Technology, and fire propagation time (Appendix G and Figure 1: Fire Propagation Curve). In many cases, the discussion of fire stations, location, and staff numbers focuses on rapid response and suppression, but decision-makers need to take other considerations into account.

- Both NFPA 1710 and 1720 recommend response times specific to structure fires and the provision of EMS rather than all emergencies, whereas the 2006 Halifax standards encompass all emergency types.
  - With respect to medical emergencies, there is greater awareness that only a few percent are life threatening where minutes make a difference, and that even serious situations such as cardiac arrest are—in the first few minutes—as capably handled by public education and awareness, and wide availability of public access defibrillators, as emergency responders making the effort to assist at high speed.
- The 4-minute travel time identified in NFPA 1710 is based on the principle of getting an adequate number of firefighters (four) on scene in a time frame to contain a fire to the room of origin. But, in addition to travel time, the total response time includes
  - notification to the dispatch centre,
  - gathering information and alerting the responding fire crews, and
  - turnout time (please see Exhibit 2: NFPA Cascade of Events).
- Efficiency at each stage of the response increases the potential to achieve a successful outcome. But many other factors affect the outcome of an emergency fire response including
  - the stage of the fire when it was reported,
  - combustibility of the room contents,
  - initial scene assessment, and
  - implementation of the mitigation strategy.

There is widespread understanding that the incidence of fire is decreasing across North America because of initiatives such as improved public education, inspection, and targeting strategies; strengthened building standards and inspection; and installation of residential sprinkler systems where permitted.

Some fire services in North America are making increased use of analytics to determine how to achieve the greatest efficiency and effectiveness from available resources. Analytics have been an essential part of fire services in the United Kingdom and Scandinavia for almost 20 years, which has supported targeted public education and inspection, a dynamic deployment[1] of resources, robust risk analysis, and a significant reduction in costs. These fire services have a team of analysts that use almost-real-time software, such as Active Informatics and others, to drill down into every facet of incident origin and response to discover cause and effect, promote prevention, reduce resource requirements, and establish realistic standards based on accurate record keeping and risk analysis.

Even though the idea of a team of analysts sounds expensive, comparatively it is only a portion of staffing one active-duty fire truck. Although calculated at a high level, Exhibit 15 (reproduced from Section 5.2) demonstrates that the difference between implementing an analytics team compared to adding one fire

[1] Dynamic deployment means moving apparatus and staff to where they are needed depending on factors such as call load, time of day, population movement, and so forth, rather than assigning apparatus and staff to a fire station 24 hours a day. Fire departments have traditionally used a form of coverage referred to as "move-up" to protect areas where trucks and staff assigned to a station and area are occupied on incident response, but this is a very limited form of dynamic deployment.

crew 24 hours a day would be an offset of over $900,000 annually. This assumes that a team of analysts will be able to find efficiencies that will avoid the need to add fire resources. Proof of success can be found in many other jurisdictions that use such an approach, particularly the United Kingdom, where there has been multi-decade pressure on municipalities to reduce costs yet maintain protection.

Exhibit 15: Analytics Team Implementation

Cost of adding one fire truck 24 hours	
Firefighter 3rd Class (2190 hours annually)	**$58,822**
Hourly rate	$27
Annual staffing hours – one fire truck	35,040
Firefighter availability (hours)	2,190
Number of firefighters required to staff one truck	16
Less: vacation	120
Less: Illness, training, and other absences	100
Firefighter replacement	3,520
Firefighter hours required to staff one truck	38,560
Times hourly rate	$1,035,697
Benefits @22%	$227,853
Cost of adding one fire truck	$1,263,550
Cost of adding four analysts	
Annual Analyst Salary (equivalent: firefighter 2nd class)	$71,427
Benefits @22%	$15,714
Total cost of one analyst	$87,141
Cost of four analysts	$348,564
Differential from adding one fire truck	($914,987)

The same analytical strategy proven to reduce cost and improve efficiency in other jurisdictions could be employed by Halifax Regional Fire & Emergency, although some changes would have to be made to the current data gathering strategy.

Several options are available to Halifax Regional Municipality with respect to future fire services standards.

1. Take no action and allow the existing standards to continue.
2. Accept revised service delivery standards based on NFPA Standards but with an initial response time of 5 minutes in the urban core rather than 4 as stated in NFPA 1710.
3. Accept service delivery standards based on NFPA Standards but amend the initial response time to 4 minutes in the urban core.
4. Choose a strategy based on improved analytics combined with clarification of Administrative Order Number 24 and the 2006 Service Delivery Standards.

The initiatives that best fit HRFE and the Halifax Regional Municipality are recommended below.

Recommendation	Report Section
Performance Monitoring and Analysis Adopt a response strategy based upon analytics to improve efficiency and effectiveness through targeted initiatives. • Undertake a cost–benefit analysis to determine the feasibility of establishing a separate fire communications centre. • Implement the use of analytics software, such as that which has been used in the United Kingdom and Scandinavia for the past two decades, and adequate staffing to support the analytics effort. • Accelerate the implementation of recommendations found within the 2014–2015 Fire Dispatching Operational Review report with respect to automated vehicle location software throughout the majority of HRFE's fleet, to improve data capture and accuracy.	5.3
Alarm Handling (Call Taking and Dispatch) • The 2006 Standards indicates that dispatch time for all incidents will be 60 seconds. • The NFPA 1221 standard states that 90% of alarm processing (similar in definition to Halifax's "dispatch time") shall be completed within 64 seconds, and 95% of alarm processing shall be completed within 106 seconds; except for some incidents such as medical, which shall be completed within 90 seconds, 90% of the time, and within 120 seconds, 99% of the time. • In 2016, in cases of structure fires, IES achieved the 90th percentile in 145 seconds; in 2017, this was achieved in 111 seconds. We recommend a target dispatch time of 90 seconds, 90% of the time, in the case of reported structure fires and special operations, which • increases the 2006 Standards by 50% and brings it more in line with experienced performance and NFPA, • is similar to part of NFPA 1221, which states 95% of alarm processing shall be completed within 106 seconds, • is applicable to reported structure fires and special operations rather than all incidents, • and may be attainable with concerted effort by the communications centre.	5.3
Turnout • The 2006 Standards indicates that turnout time for core stations, and rural stations when career staff are on duty, will be 60 seconds for all incident types. • NFPA 1710-16, 4.1.2.1 states a turnout time of 80 seconds for fire and special operations response.	5.3

• In 2016, career firefighters achieved a 90th percentile turnout time for structure fires of 173 seconds; in 2017, this was achieved in 172 seconds. We recommend a revised target turnout time for stations 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18, and composite stations when career firefighters are on duty, from the current 60 seconds to 90 seconds at the 90th percentile for fire responses, achieved over a three-year period. i. In year one, target a 120-second benchmark; ii. in year two, target a 105-second benchmark; and, iii. in year three, achieve a 90-second turnout time.	

The NFPA turnout standard is based on ideal situations of apparatus access and firefighter readiness to respond. We recommend this phased-in approach based on the following considerations:

- Turnout is affected by
  - fire station design and travel routes to apparatus;
  - activities of the firefighters at the time of the alarm (training, maintenance responsibilities, location within or outside the fire station);
  - department policies regarding donning bunker gear, and procedures for firefighter safety (donning breathing apparatus, seat belts) prior to the initiation of travel time; and
  - firefighter understanding and acceptance of performing optimally in each phase of response to minimize total response times.
- Response to the comparative survey indicates that four of the consulted communities use a 90-second turnout time even though NFPA 1710 proposes an 80-second turnout time.

Additionally, a phased-in approach will provide opportunities for educating firefighters, measuring actual turnout times, and determining the practicalities of a final turnout time standard.

Recommendation	Report Section
Turnout Rural Districts Districts and stations 11, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 33, 34, 35, 36, 38, 39, 40, 41, 42, 43, 45, 47, 48, 50, 52, 54, 55, 56, 58, 60, 63, and 65 • The 2006 Standards indicates that turnout time for volunteers in rural districts (population density under 100 persons per square kilometre) will be 6 minutes (360 seconds) or less, 90% of the time. • NFPA 1720-14 (volunteer fire departments) does not specify a turnout time, but table 4.3.2 of 1720-14 (please see Appendix F) describes response time criteria and number of firefighters depending on population density. Response time, for areas with a population density of fewer than 1,000 people per square mile (2.6 square kilometres), is described as the time interval from the end of dispatch notification to arrival at the incident. This definition takes in both turnout time and response time.	5.3

• In 2016, volunteer firefighters achieved a 90th percentile turnout time of 462 seconds for all incidents; in 2017, this was achieved in 468 seconds. We recommend continuation of the existing turnout standard for volunteers in rural districts, even though volunteers have not been able to achieve the 2006 Standard. Based on the consultants' experience, it is a target that is common in other volunteer fire departments and should be strived for.	
Response Time Core Fire Stations • The 2006 Standards indicates that response time (travel time) for core stations will be 5 minutes or less, 90% of the time, for single unit responses or the first arriving vehicle of a multiple unit response. The 2006 Standards does not differentiate between fires and other incident types. • NFPA 1710-16, 4.1.2.1 states a travel time of 240 seconds (4 minutes) for the first arriving engine company at a fire suppression or medical incident requiring an automatic external defibrillator. • In 2016, career firefighters in the core districts achieved a 90th percentile travel time of 286 seconds for structure fires; in 2017, it was 289 seconds. ▪ This performance is better than the 2006 Standards of 300 seconds travel time. We recommend continuing the initial response time target for urban core stations 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18 at 5 minutes for the first arriving apparatus.	5.3

- The comparable jurisdictions survey (Appendix A) indicates 240 seconds (4 minutes) is a common travel time target, but of those who reported on their ability to meet this standard, only one indicated a compliance of 95%, while others could achieve the 4-minute travel standard 80% of the time or less.
- Attempting to achieve compliance with NFPA 1710-16 (240 seconds for the first arriving engine company at a fire suppression or medical incident) is likely to require additional new fire stations and increased staffing in the urban area, as well as the closing and relocation of other fire stations to avoid response area overlaps and inefficiency after new stations are located.
- If consideration is given to capital and operational enhancements to try to attain a 240-second travel time, HRFE should first achieve a reliable data stream upon which to base any decisions.

Recommendation	Report Section
Response Time Rural Districts • The 2006 Standards indicates that response time (travel time) for rural stations will be 10 minutes or less, 90% of the time. The 2006 Standards does not differentiate between single or multiple unit response or between fires and other incident types.	5.2.1

• NFPA 1720-14 (volunteer fire departments) does not specify a turnout time, but table 4.3.2 of 1720-14 (please see Appendix F of this document) describes response time criteria and number of firefighters depending on population density. Response time, for areas with a population density of fewer than 1,000 people per square mile (2.6 square kilometres), is described as the time interval from the end of dispatch notification to arrival at the incident. This definition takes in both turnout time and response time. ▪ Table 4.3.2 (NFPA 1720-14) lays out minimum staffing, response time, and percentage of time in which to meet the objective. • In 2016, volunteer firefighters in the rural districts achieved a 90th percentile response (travel) time of 556 seconds for all incidents; in 2017, it was 549 seconds. This is better than the 2006 Standards target of 600 seconds, 90% of the time. ▪ There was insufficient information for the consultants to measure the number of firefighters that responded to rural fire incidents. We recommend that the standard for response by volunteer firefighters remain as stated in the 2006 Standards. Volunteers will continue to provide their best effort to protect their districts and adjacent districts. • Although it is desirable to improve response standards, adopting those such as in NFPA 1720-14 will still be met with the practicalities of attracting and training enough volunteers, and their lack of availability during work hours or holiday periods. • Where sufficient volunteers are available, HRFE should strive to improve response times and the number of volunteers responding to critical incidents.	
Multiple Unit Responses Core Fire Stations • The 2006 Standards indicates that response time (travel time) for subsequent arriving response units of a multiple unit response or alarm assignment will be 8 minutes, 90% of the time. ▪ A full alarm assignment consists of 12 persons. ▪ The 2006 Standards does not differentiate between fires and other incident types. • NFPA 1710-16, 4.1.2.1 states a travel time of 480 seconds (8 minutes) for the deployment of an initial full alarm assignment at a fire suppression incident that is other than a high rise. ▪ NFPA 5.2.4.1.1 describes the requirement for 14 firefighters at a full alarm assignment for a single-family dwelling fire incident (15 if an aerial device is used).	5.2.1

• In 2016, career firefighters in the core districts achieved a 90th percentile assembly of 12 firefighters at structure fires in 9 minutes and 30 seconds (570 seconds) and an 8-minute (480 second) assembly in 70% of incidents. • In 2017, career firefighters in the core districts achieved a 90th percentile assembly of 12 firefighters at structure fires in 10 minutes and 15 seconds (615 seconds) and an 8-minute (480 second) assembly in 67% of incidents. ▪ Although based on only two years of data, multiple unit response to the urban area has declined from 2016. We recommend that HRFE should achieve, at minimum, the 2006 Standards of 12 firefighters in 8 minutes for multiple unit responses throughout the core area of the municipality (station areas 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18).	

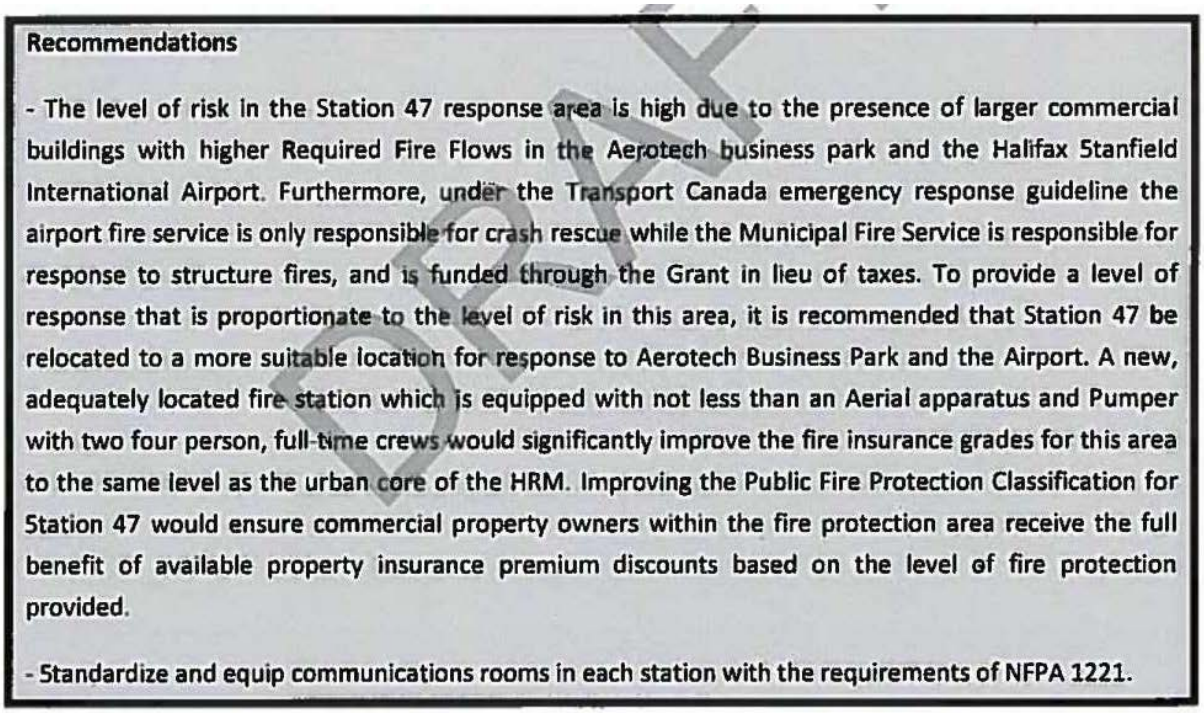
- We are aware that Halifax Regional Fire & Emergency has been undertaking a hiring process during 2018, but our understanding is that except for an enhancement of one person per shift at the 24-hour composite stations, and increased staffing for the aerial at station 13, the balance of hiring is for the purpose of offsetting overtime.
- We anticipate that the only way to achieve the 2006 Standards for multiple unit response is via new stations and new staff for those stations in order to reduce travel time. Adding stations may cause excessive response area overlap with existing stations, meaning that some existing stations may have to be relocated because of redundancy.
- Currently, response from multiple stations is required in order to assemble sufficient firefighters to fight a fire in a single-family dwelling, meaning that units from other stations must be moved toward the vacated station areas to provide backup protection.
  - This is further compounded in the case of a multi-unit dwelling, high-rise, and commercial establishments, which require more than 15 firefighters for suppression efforts.
- Alternatively, increasing the staff levels at existing stations, where space permits, will improve the opportunity to assemble 12 to 14 firefighters within 8 minutes.
  - Increasing the number of firefighters at strategically located stations will also improve response and resource availability to fires in multi-unit dwellings, high-rises, and commercial establishments, and provide backup to both urban and rural stations.
- We further anticipate that meeting the 2006 Standards for multiple unit response represents a multi-million-dollar capital investment for stations and apparatus as well as continuing operational expenses for staff.
- Achieving the 2006 Standards for multiple unit responses is not likely to meet the NFPA Standard for a full alarm assignment, but HRFE will draw closer to that standard.

These recommendations underline the importance of accurate data for decision making and the importance of investing in analytical software and staff to ensure that decisions are made—and money spent—based on best available information.

Recommendation	Report Section
We recommend that Halifax Regional Fire & Emergency continue its previous work of determining the most effective station locations with the objective of presenting station location and staffing options for achieving, at minimum, in the core area, the 2006 Standards of 12 firefighters in 8 minutes, and preferably 14 firefighters in 8 minutes—15 if an aerial apparatus is deployed.	5.3

Special Circumstances – the Airport Area

A February 2015 report by the Fire Underwriters Survey (FUS)—which is a commercial product provided to Canadian insurance companies that subscribe to the service, but which also provides the benefit of resource consulting to municipalities—recommended that station 47 in the community of Goffs should be relocated and staffing increased. The basis for this recommendation is copied here from the FUS report:



Recommendations

- The level of risk in the Station 47 response area is high due to the presence of larger commercial buildings with higher Required Fire Flows in the Aerotech business park and the Halifax Stanfield International Airport. Furthermore, under the Transport Canada emergency response guideline the airport fire service is only responsible for crash rescue while the Municipal Fire Service is responsible for response to structure fires, and is funded through the Grant in lieu of taxes. To provide a level of response that is proportionate to the level of risk in this area, it is recommended that Station 47 be relocated to a more suitable location for response to Aerotech Business Park and the Airport. A new, adequately located fire station which is equipped with not less than an Aerial apparatus and Pumper with two four person, full-time crews would significantly improve the fire insurance grades for this area to the same level as the urban core of the HRM. Improving the Public Fire Protection Classification for Station 47 would ensure commercial property owners within the fire protection area receive the full benefit of available property insurance premium discounts based on the level of fire protection provided.

- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.

The FUS recommendation is to enhance resources from the current (2018) 15 volunteers to two 4-person career crews (8 firefighters per 24 hours), an aerial apparatus, and a pumper.

Pomax finds it difficult to support this recommendation for several reasons, some of which were not apparent when the FUS report was written.

- In 2016, there were 60 incidents in station 47's area.
- In 2017, there were 51 incidents in station 47's area.
- In 2016, there were 185 incidents in the neighbouring area of station 45.
- In 2017, there were 187 incidents in the neighbouring area of station 45.
- Halifax Regional Fire & Emergency makes use of Quint apparatus, which provides the functions of a ladder or aerial truck, and a pumper, as well as carrying a water supply. Although a Quint

ladder cannot reach the heights of an aerial platform, it will satisfy most requirements for fire suppression and rescue at a lower cost than an aerial.

- A mutual aid agreement with the community of Enfield, which has an aerial apparatus, provides backup capabilities as required.

Recommendation	Report Section
Rather than support the recommendation made by FUS, which was drafted in a different operational environment, Pomax recommends that HRFE • continue its discussions with Halifax Stanfield International Airport to find a satisfactory location on or near the airport grounds for a relocated fire station; • determine, depending upon the outcome of the discussions, whether the existing station 47 can be decommissioned; • evaluate, in the interim, the staffing levels at station 45 in the community of Fall River, including response to the airport area—for example, composite staffing of four career firefighters 24 hours a day at station 45, supported by an adequate cadre of volunteers, would provide fire suppression protection to the airport area, and those firefighters could also be active in promoting public education and prevention throughout the response area; • utilize apparatus such as a Quint rather than an aerial to service the Aerotech Business Park and airport area.	5.4

Call Taking and Dispatch

Recommendation	Report Section
We recommend that Halifax Regional Fire & Emergency • conduct a process mapping exercise of call taking and dispatch methods at the IES communications centre, and turnout activity at each fire station, to determine the practices and procedures that are impeding timelier dispatch and turnout; and • provide council with an annual report indicating compliance, and areas of non-compliance, to whichever service delivery standard option council adopts.	5.5
We recommend that Halifax Regional Fire & Emergency and IES make an immediate concerted effort to collect the response data required to assess the practicality of, and compliance with, whichever service delivery targets are adopted. • We have noted elsewhere in this report concerns regarding the accuracy of emergency response data required to confidently determine compliance with service delivery standards. • Recommendations made in previous studies, with respect to improved record keeping, included a fire service liaison position located at the Integrated Emergency Services communications centre. Responsibilities would entail ensuring accurate, fire-service-specific data capture. That recommendation bears repeating because we are not aware that it has been implemented. • Additionally, HRFE and IES should implement the following measures:	

▪ Ensure accurate and consistent data recording and collection by developing or refining HRFE and IES data collection policies and procedures. ▪ Train all affected staff in data recording and collection policies and procedures. ▪ Implement an effective quality assurance process through monitoring, mentoring, and enforcing policies and procedures.	

Implementation Recommendations

In order to achieve accurate incident data collection for ongoing monitoring of emergency response, we recommend that IES and HRFE

- work together at senior management levels to implement data entry standards, consistent data collection policies, and quality control management processes as laid out in Appendix B of the 2015 Fire Dispatching Operational Review report, and review emergency response times on a quarterly basis to determine compliance with response standards and data quality; and
- provide an annual report to council detailing compliance with the approved service delivery standards.

We note that an earlier primary recommendation is the separation of the police and fire call taking and dispatch function. The recommendations immediately above are valid until a separation occurs, and remain valid when HRFE operates its own call taking and dispatch function.

Implementing changes to service delivery will require oversight and senior staff leadership to ensure successful implementation of proposed service delivery standards.

Recommendation	Report Section
Create a focused change management plan that includes • using staff meetings, training sessions, and other opportunities for face-to-face discussions with fire department staff, volunteers, and the Integrated Emergency Services centre to share information, create understanding about new operating procedures, and build acceptance of the changes among those impacted; • specific in-service training; and • timely opportunities to receive feedback as changes are implemented.	5.6

A previously noted requirement of this review is to provide "a statistical baseline for ongoing performance measurement." Performance measurement is the process of collecting and analyzing historical information regarding emergency response to determine if approved service delivery standards are being met. If the historical data are unreliable, as is the case with Halifax Regional Fire & Emergency, setting a baseline for ongoing measurement is subject to error, and the validity of performance results can be questioned.

Many of the aforementioned recommendations pertaining to data gathering, accuracy, technology implementation, and others will have to be accomplished in order to establish a statistical baseline for ongoing performance measurement. Nevertheless, we can be confident that there are few categories of response where HRFE is able to meet the 2006 Standards without implementation of the recommendations in this report.

Review of Administrative Order Number 24 and Halifax Regional Fire & Emergency Service Delivery Levels Standards of Response – 2006

Section 1 Introduction & Background

1.1 Background of the Assignment

Beginning in 2012, Halifax Regional Fire & Emergency performed a full operational and service review of their business unit. The resulting report presented several recommendations and options for reconfiguring fire services and mapping the next steps to bring together the necessary resources to ensure appropriate levels of fire coverage within the Halifax Regional Municipality. The report laid the groundwork for moving ahead with changes intended to result in better business intelligence and an improved capacity to make informed choices about how best to meet the needs of the municipality.

During the operational and service review it became apparent that further review and revision were required of the service delivery standards set out in both the 2006 Council Report titled *Service Delivery Standards for Halifax Regional Fire & Emergency*, which addresses

a) services provided to the municipality, and
b) turnout[2] and response[3] time standards for both career (full-time) and volunteer firefighters;

and *Administrative Order Number 24, Respecting Fire and Emergency Service in Halifax Regional Municipality*, which defines the functions and responsibilities of Halifax Regional Fire & Emergency.

Halifax Regional Municipality engaged Pomax Consulting to conduct an independent review of the *Service Delivery Standards* and *Administrative Order Number 24.*

The project's objectives were as follows:

- Evaluate Halifax Regional Fire & Emergency's
  - expected services and levels as defined in Administrative Order Number 24,
  - performance, and
  - ability to meet standards as defined in the *Service Delivery Standards for Halifax Regional Fire & Emergency*.
- Develop target recommendations regarding types and levels of response for urban, suburban, and rural areas of the municipality based on acceptable risk, population density, service offering, performance measurements, and jurisdictional scans.
- Propose revisions to service delivery targets.
- Develop a phased-in implementation plan for recommendations, including a statistical baseline for ongoing performance measurement.
- Provide recommendations for any associated policy development.
- Estimate the associated costs of implementing the recommendations.

[2] The 2006 Service Delivery Standard defines turnout time as the time interval from the receipt of the call notification by the station(s) or apparatus, until the time the crew in the apparatus notifies the Dispatch Centre that they are en route to the call.
[3] The 2006 Service Delivery Standard defines response time as the time that begins when units are en route to the emergency incident and ends when units arrive at the scene.

The study methodology involved

- a thorough review of pertinent legislation;
- examination of industry standards and practices;
- ongoing consultation with the steering committee;
- rigorous analysis of historical incident data;
- a review of previously completed studies in relation to Halifax Regional Fire & Emergency; and
- a comparative survey of similar jurisdictions (Appendix A).

1.2 Legislative Authority

In Nova Scotia, the Municipal Government Act incorporates fire and emergency services legislation. However, this Act does not apply to the Halifax Regional Municipality. Instead, the *Halifax Regional Municipality Charter, Chapter 39 of the Acts of 2008*, is the instrument that gives the Council of the Municipality "*broad authority to pass by-laws, and respect its right to govern the Municipality in whatever ways the Council considers appropriate within the jurisdiction given to it* (Purpose of the Act)."

- Part X, Section 304, of the Charter states that "*The Municipality may maintain and provide fire and emergency services by providing the service, assisting others to provide the service, working with others to provide the service or a combination of means. 2008, c. 39, s. 304."*
- Section 307 (1) of the Charter allows council to "*make policies respecting full-time, volunteer and composite fire departments and emergency service providers in the Municipality*."
- *Administrative Order Number 24* and the *Service Delivery Standards* were adopted prior to the *Halifax Regional Municipality Charter* (2008), when the Municipal Government Act applied (some of the content is no longer applicable to the Halifax Regional Municipality).
- Section 293 of the Municipal Government Act states, "*A municipality may maintain and provide fire and emergency services by providing the service, assisting others to provide the service, working with others to provide the service or a combination of means*," which is the same as Part X of the Charter.

Administrative Order Number 24 (please see Appendix B), approved by council, defines the fire department regulations regarding

- registration of the fire department;
- the chief officer authority and responsibilities in relation to fire service staff qualifications, promotions, and discipline; and
- the services the fire service shall endeavour to provide.

Halifax Regional Council adopted *Service Delivery Standards for Halifax Regional Fire & Emergency* on February 14, 2006 (please see Appendix D).

- The standards were developed based on the 2001 editions of the National Fire Protection Association (NFPA) standards 1710 and 1720, with adjustments made to account for
  - the diversity of the fire protection districts throughout the region; and
  - the significant financial implications of adopting the NFPA standards as they were written.

Three newer editions of the NFPA standards have been published since 2001.

NFPA 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Career Fire Departments

NFPA 1720 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Volunteer Fire Departments

1.3 The 2006 service delivery standards

- The 2006 *Fire and Emergency Service Delivery Levels—Standard of Response* lays out
  - the definitions of each time benchmark (dispatch, turnout, response time);
  - acceptable exemptions to response times to islands or other properties that are inaccessible by public or private roads;
  - an extraordinary exemption to deal with any natural disaster, or similar conditions, or in the event a state of emergency is invoked;
  - service delivery targets (Table 1), for all incidents other than those with acceptable or extraordinary exemptions; and
  - the requirement for annual auditing of the service targets.

The 2006 service delivery standards are summarized in Table 1. Pertinent terminology is defined in the text box following the table.

Table 1: Summary of 2006 HRFE Service Delivery Standards

A	**Fire protection districts with population density over 100 persons per square kilometre**
1	A dispatch time of 60 seconds, 90% of the time
2	A turnout time of 60 seconds, 90% of the time
3	A response time of 5 minutes or less, 90% of the time, for single unit responses, or for the first arriving unit of a multiple unit response regardless of the nature of the emergency service to be provided
4	A response time of 8 minutes or less, 90% of the time, for subsequent arriving units of a multiple unit response or alarm assignment dispatched with the first arriving apparatus
5	A full alarm assignment consists of 2 engines, 1 aerial, 1 tactical unit, for a total of 12 personnel
6	An Incident Safety Officer and a dedicated Incident Commander will be dispatched on full alarm assignments, with no response time criteria
7	A subsequent alarm assignment consists of a minimum of 2 units (configuration acceptable to the Incident Commander) for a total of 8 additional personnel
B	**Fire protection districts with population density under 100 persons per square kilometre**
1	A dispatch time of 60 seconds, 90% of the time
2	Staff turnout (when career staff are on duty): A turnout time of 60 seconds, 90% of the time Volunteer turnout: A turnout time of 6 minutes or less, 90% of the time
3	A response time of 10 minutes or less for the first arriving apparatus, 90% of the time

Incident: A call for assistance from a member of the public, or another emergency service or utility.

Dispatch Time: The elapsed time from the moment when the first call for assistance (alarm) is received to the time firefighters are notified to respond.

Turnout Time: The time interval from the moment firefighters are notified to respond, to the time when the dispatch centre is notified that the apparatus (fire vehicle) is en route.

Response Time: The time from firefighter notification to the dispatch centre that apparatus is en route, to the time firefighters notify the dispatch centre that they are at the incident.

Key Findings

Our review revealed the following key findings:

- The *Service Delivery Standards for Halifax Regional Fire & Emergency* encompass all emergency response types, whereas other often-referenced standards from the NFPA address response times specific to structure fires and special operations, and the provision of emergency medical services (EMS).
- Halifax Regional Fire & Emergency is not meeting the response time criteria stated within the 2006 Standards when applied to all emergency response types, but it is meeting the standard for initial travel time by a single fire truck to structure fires in both urban and rural areas.
- The current model of integrated dispatch (fire and police) is not effectively meeting the data collection or quality assurance needs of Halifax Regional Fire & Emergency (please see Appendix C).
- The emergency service types and levels authorized by Administrative Order Number 24 may not accurately reflect services being provided, or that should be provided, due to the diverse risks throughout the region and the varying needs of communities.
- A survey distributed as a component of this study, to fire departments of similar-sized communities across Canada, confirms that municipalities have to determine service types and response standards specific to the risks and needs of their service area.
- Recommendations from prior reviews, which were intended to ensure accurate and consistent data collection, have not been implemented or have a pace of implementation that is more gradual than intended by the consultants. This affects data confidence.

Section 2 Comparative Jurisdictions Survey

2.1 Background

One of the requirements of this assignment is to develop target recommendations regarding the acceptable types and levels of response for urban, suburban, and rural areas of the municipality based on acceptable risk, population density, levels of response, service offering, performance measurements, and jurisdictional scans. The scope of the assignment includes an industry standards and best practices review. To assist with achieving these objectives, a survey of similar jurisdictions was carried out.

It is important to remain aware that municipalities which may appear similar can have very different fire risks and therefore different fire protection needs, which determine the services, standards, and resource allocation specific to each community. Variables may include

- demographics,
- age of buildings and fire load,
- terrain, which affects response,
- street patterns and speed,
- building use (commercial, residential, industrial),
- industry type, and
- suppression systems such as commercial and residential sprinklers.

These differences limit the value of surveys for objective analysis; nevertheless, they can still be informative.

Comparing HRFE's response standards and statistics with those reported[4] by other communities provides some information about performance in relation to peer municipalities.

- Sixteen municipal fire departments were asked to provide information for comparative purposes:
  - 15 opened the survey, and 11 responded.
- Of the 11 responses,
  - 3 answered only the type of department, and
  - 1 completed only the first five questions.
- Seven fire departments, including Halifax Regional Fire & Emergency, substantially completed the survey. Results are provided in Appendix A.

Overall, the survey responses confirm there are minimal demographic or operational similarities between the communities:

- Halifax and Ottawa are the only composite fire departments.
- Population served ranges from 213,000 (Richmond, BC) to 1.9 million (Montreal, QC).
- Fire department coverage areas range between 129 square kilometres (Richmond, BC) to just over 2,700 square kilometres (Ottawa and Halifax).

[4] Verifying the information reported by other fire departments is outside of the scope of this review.

- The percent of funding allocated to compensation is similar across fire departments—in the range of 90%–96% of the total budgets.
- There are no similarities in the number of staff members in management and support positions; however, Ottawa, Mississauga, and Calgary all reported more than 30 fire prevention positions.
- Montreal has the most fire stations (67), followed by Halifax (51) and Ottawa (45).
- The number of suppression staff ranges between 201 (Richmond, BC) and 2,486 (Montreal, QC). Halifax had 409 suppression staff at the time of the survey.
- There is no basis for comparison to the other communities due to significant differences in population, coverage areas, number of stations, and community risk factors.
- Halifax and Ottawa have similar numbers of volunteers—631 and 517, respectively.
- Five departments, including Halifax, have a target dispatch time of 60 seconds.
- Halifax is the only department with a turnout time of 60 seconds; two departments have a turnout time of 80 seconds, and four have a 90-second target.
- Halifax and Ottawa were the only departments that provided their turnout times, travel times, and number of responders.
- Four departments indicated the percentage of time that benchmarks were met:
  - Dispatch time met: 80.4%–95% of the time (3 responses)
  - Turnout time met: 60.2%–90% of the time (3 responses)
  - Travel time met: 67%–95% of the time (4 responses)
- Six fire departments indicated that service delivery standards are approved by council and are based upon population density, risk, and NFPA guidelines.
- Four departments indicated that service types and levels were based on community needs and circumstances.

2.2 Conclusions

The survey did not reveal similar response practices to the extent that they could assist in recommending objective targets that can be used by Halifax Regional Fire & Emergency. The survey responses do confirm that municipalities have to determine standards and targets that are specific to their service area.

Section 3 Service Types and Level of Service

3.1 Administrative Order Number 24

A requirement of the project is to "Evaluate HRFE's expected services and levels as defined in Administrative Order Number 24," which authorizes the services to be delivered by Halifax Regional Fire & Emergency.

The Administrative Order, in Part 1, 3(2), states

> *(2) The Fire Service shall endeavour to provide the emergency services designated in Appendix "A" in the whole of Halifax Regional Municipality with the exception of those areas serviced by a volunteer fire department registered pursuant to Part II of this Administrative Order.*

"Part II of this Administrative Order" applies to volunteer fire departments that are not part of the municipality but are registered as a fire department under Part 10 of the Nova Scotia Municipal Government Act, which was in force at the time of adopting Administrative Order Number 24. There are no fire departments of that nature within the Halifax Regional Municipality, which means the Administrative Order Number 24 applies throughout Halifax and Part II is not applicable.

Appendix A of the Administrative Order states, in full

> *The Regional Fire Service shall endeavour to provide emergency services in the Halifax Regional Municipality formerly made up of the City of Halifax, City of Dartmouth, Town of Bedford and the County of Halifax at the service levels indicated below unless otherwise indicated by registration or policy;*

***Fire and Related Emergencies**:*	*Structural and Wildland*
Medical Response:	*1st Responder*
Vehicle Rescue:	*Operational*
Water Rescue:	*Operational*
Ice Rescue:	*Operational*
Structural/Confined Space Rescue:	*Operational*
High Angle Rescue:	*Operational*
Hazardous Materials:	*Operational*
Search and Rescue:	*Assistance*
Fire Prevention and Education:	*Inspections, Investigations, Public Education*

However, the "service level" (righthand column above) indicated in Appendix A of the Administrative Order is not defined in Administrative Order Number 24 except in Appendix C – DEFINITION OF TERMS USED IN THE REGISTRATION FORM, which is in reference to Appendix B of the Administrative Order. Appendix B is an application for registration "as a fire department and/or emergency service provider independent of the Fire Service," which refers to those fire and emergency services operating under Part 10 of the Nova Scotia Municipal Government Act. Remember, there are no fire services within the municipality operating under Part 10.

Although it is reasonable to suggest that the terminology definitions used in Appendix C would be the same definitions applicable to Halifax Regional Fire & Emergency when carrying out its day-to-day duties, there are no definitions in the Administrative Order that are directly applicable to the current fire service delivery shown in Appendix A of the Administrative Order.

Table 2, below, offers general definitions of service level proficiency as found in Appendix C of Administrative Order Number 24. The purpose of Appendix C is to define the terms used in Appendix B, which is the registration form for a type of fire service delivery that does not exist in the municipality.

Table 2: Administrative Order Number 24 Definition of Service Levels

Proficiency	Definition from Administrative Order Number 24
Awareness	First responders at the awareness level are those persons who, in the course of their normal duties, could be the first on the scene of an emergency. First responders at the awareness level are expected to recognize the situation, call for trained personnel, secure the area, and provide minimum intervention.
Operational	First responders at the operations level are those persons who respond as the initial response to an incident for the purpose of protecting nearby persons, the environment, or property from the effects of the incident. First responders at the operations level are expected to respond in a defensive fashion to control, prevent a worsening of the incident, and provide services within their capabilities.
Technical	First responders at the technician level are those personnel who [are equipped and trained to] respond, as either initial call-out or as a mutual aid response to contain and control the incident. This level of service usually will provide a high degree of intervention.

3.2 Service Delivery Standards

The Service Delivery Standards are intended to encompass the services outlined in Halifax Regional Municipality Administrative Order Number 24. Appendix B of the Service Delivery Standards lays out a list of services to which the standards apply. Appendix B is similar to, but not the same as, what is referred to as the "service levels" indicated in Appendix A of Administrative Order Number 24. In particular, Appendix B of the Service Delivery Standard categorizes all incident types as Fire and Fire Related Emergencies. One of the incident types in the category is Structural and Wildland and the emergency service provided is "Offensive and Defensive." However, Appendix A of Administrative Order Number 24 indicates Fire and Related Emergencies as an incident type rather than a category as in the Service Delivery Standard, and the service level is "Structural and Wildland."

We acknowledge that the explanations of Administrative Order Number 24 and the Service Delivery Standard in sections 3.1 and 3.2 are hard to follow and confusing. That is because, when read carefully and the references related to each appendix are followed, the Administrative Order and the Service Delivery Standards **are** confusing. Our review revealed the service types and levels listed in the two documents do not accurately reflect the services being provided. We recommend updating both documents to reflect the current organization and service delivery of Halifax Regional Fire & Emergency.

Column 4 of Table 3, below, shows that service levels have evolved over the last decade and are not delivered in accordance within the definitions in Administrative Order Number 24 and the 2006 Service Standards. The role of Halifax Regional Municipality's council in defining service types and the proficiency level at which they will be provided by the fire department is a critical component of reducing the risk of municipal liability and ensuring firefighter safety. Once defined and approved by council, service provision, including fire prevention, inspections, and firefighter training requirements, would then be operationalized through policies and standard operating guidelines.

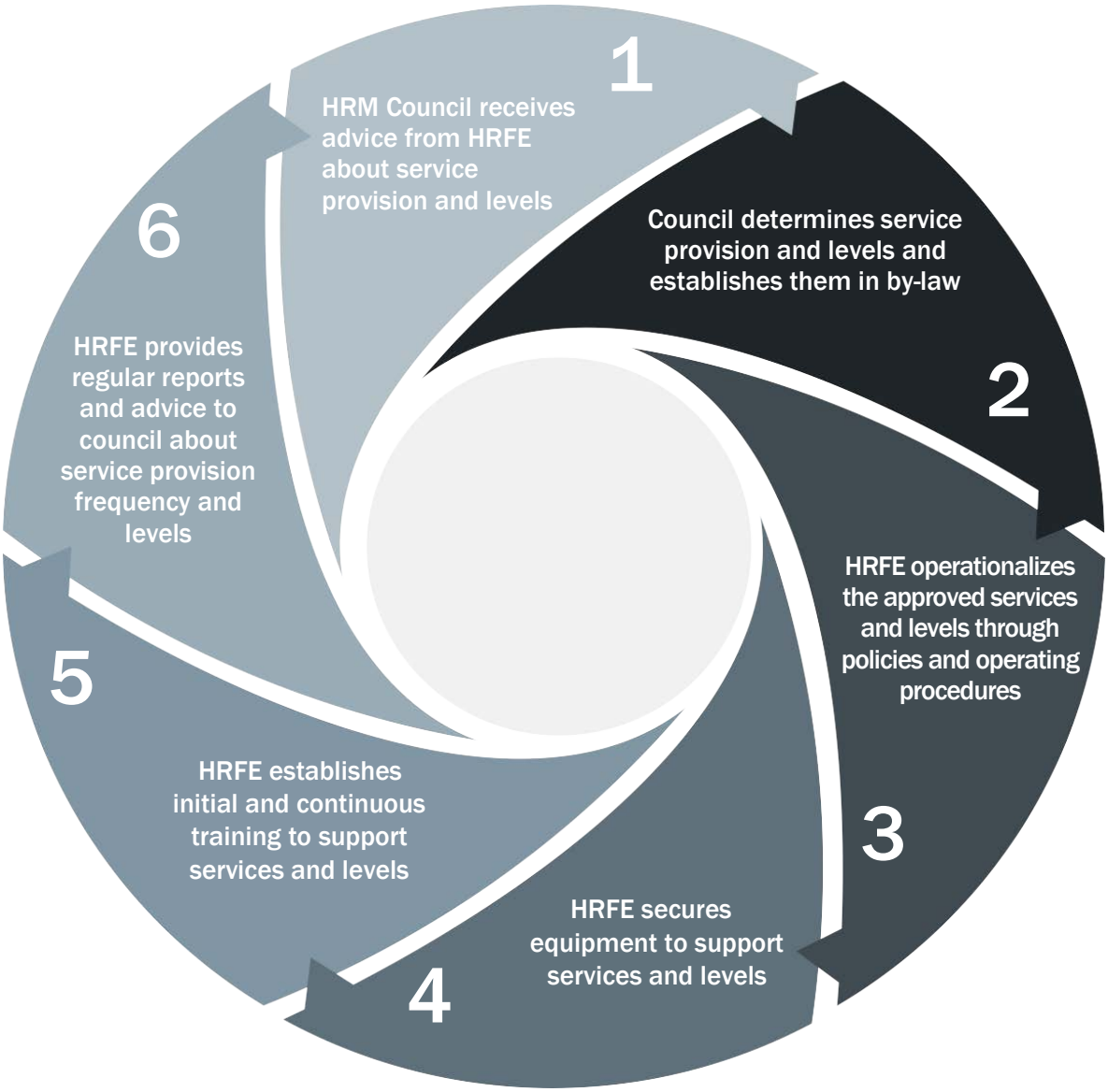
Table 3: Halifax Regional Fire & Emergency Service Types and Levels

1	2	3	4
Service Type	**Proficiency**		
	As Stated in Administrative Order 24	**As Stated in the 2006 Service Standards**	**As HRFE reported in the Comparable Jurisdictions Survey Response**
Fire and Related Emergencies	Structural and Wildland		
Structural and Wildland		Offensive and Defensive	
Structural[5]			
Medical Response	1st Responder	Medical First Responder	Technical
Vehicle Rescue	Operational	Operational	Technical
Water Rescue	Operational	Operational	Technical
Ice Rescue	Operational	Operational	
Structural/Confined Space Rescue	Operational	Operational	Technical
High Angle Rescue	Operational	Operational	Technical
Hazardous Materials/CBRN	Operational	Operational	Technical
Search and Rescue	Assistance	Assistance (Ground Search & Rescue)	
Fire Prevention and Education	Inspections, Investigations, Public Education	Inspections, Investigations, Public Education	
Heavy Equipment/Machinery Rescue			Technical
Trench Rescue			Technical
Heavy Urban Search and Rescue			Operational
Marine Firefighting			Awareness
Wildland Firefighting			Operational

A suggested process for Halifax Regional Council and the Halifax Regional Fire & Emergency to follow in establishing service provision and competency is shown in Exhibit 1.

[5] Surveyed fire services were not asked to indicate structural firefighting proficiency since, as mid-size to large fire services, it was assumed that they would all perform at the technical level.

Exhibit 1: Establishing Service Levels and Competency



Conclusion:
Administrative Order Number 24 and the Service Delivery Standards are not mutually supporting due to differences in, or the application of, service levels and definitions, which may cause misunderstanding. Neither is the current level of service, as noted by HRFE's response to the comparable jurisdictions survey, reflective of Administrative Order Number 24 and the Service Delivery Standards, which could be interpreted as Halifax Regional Fire & Emergency not being authorized by council to conduct the level of service currently being provided.

This lack of clarity and coordination between the two documents may negatively affect Halifax Regional Municipality in the event that legal action is taken against the municipality because of a response or activity by Halifax Regional Fire & Emergency.

Discussion:
There are a number of philosophical and practical matters that must be considered in determining the types and levels of services appropriate to the needs and circumstances of a community, including

- historical demand for service determined by analysis of accurate incident data;
- availability of similar services provided by other agencies (nearby fire or other emergency services);
- community expectations and understanding of the types of services provided by the fire department;
- the practical reality that community members call the fire department for a multitude of services (anticipated and unanticipated) and there is a moral obligation to respond at some level;
- specialized emergency response services require human, equipment, and training resources;
- communities have limited financial resources; and
- the types and levels of services to be provided by the fire department, and the resources required to effectively operationalize services, should be approved by council.

Levels of Response

When a resident or business owner calls 9-1-1 expecting a response by the fire department, the municipality must provide some level of assistance, which may involve the following:

- Informing the caller that the fire department does not provide the service requested (for example, an animal rescue or pumping water from a basement). However, the fire department might provide information about an entity that could provide appropriate assistance to the caller.
- Alerting the fire department that a response is required to a council-approved call type.

Services to be provided by Halifax Regional Fire & Emergency should consider the historical frequency of responses and be defined by the type and level of service. Fire department levels of service are typically based upon applicable NFPA definitions and should be approved by council.

3.3 Urban Search and Rescue

Halifax Regional Fire & Emergency is in a unique geographical and service provision situation in that it is the largest municipality in Nova Scotia and New Brunswick and exists in a relatively isolated geographical location. This limits timely assistance to HRFE, from other agencies, in the event of a major or technically complicated emergency. Additionally, HRFE may be requested to aid other communities in Nova Scotia. In a separate project, Pomax conducted a review of Nova Scotia's fire services on behalf of the Union of Nova Scotia Municipalities and the Association of Municipal Administrators, and was informed by a number of fire departments that they expected HRFE would assist with major or technical emergencies, not only as part of mutual aid but also with technical rescue expertise.

During an earlier phase of this assignment, when the comparative fire department survey was being completed, the federal government was evaluating its role in the support and funding of urban search and rescue, particularly in Halifax and Montreal. When completing the survey, HRFE indicated their service level related to Heavy Urban Search and Rescue (HUSAR) as "operational" (support efforts and participate).

Public Safety Canada defines Urban Search and Rescue (USAR) in the following way:

> *Urban Search and Rescue refers to technical search and rescue skills used in the event of a disaster. These specialized skills play a critical role in a variety of emergency situations, including urban building collapses, mudslides, flooding, and forest fires, among other disasters.*
>
> *USAR is classified into light, medium or heavy capability based on the associated training requirements and equipment.*
>
> *"Heavy" Urban Search and Rescue (HUSAR) is the most technically specialized form of USAR. HUSAR Task Forces are interdisciplinary teams comprised of specialists from across the emergency response spectrum. Capabilities include search and rescue, communications, logistics, emergency medical assistance, technical and canine search, and structural assessment.*

NFPA 1670, Standard on Operations and Training for Technical Search and Rescue Incidents, provides the following definitions:

- The **Awareness** Level "represents the minimum capabilities of organizations that provide response [to] technical search and rescue incidents." (4.1.2-1) "The minimum training for an organization shall be at the awareness level." (4.1.7.1.1)
- The **Operations** Level "represents the capability of organizations to respond to technical search and rescue incidents and to identify hazards, use equipment and apply limited techniques specific in this standard to support and participate in technical search and rescue incidents." (4.1.2-2)
- The **Technical** Level "represents the capability of organizations to respond to technical search and rescue incidents, to identity hazards, use equipment, and apply advanced techniques specified in this standard necessary to coordinate, perform, and supervise technical search and rescue incidents." (4.1.2-3)

We understand that the federal government has committed to a reinstatement of funding and support for HUSAR capabilities across Canada, which will include new support for Halifax Regional Fire & Emergency to develop an enhanced HUSAR capability. Excerpts from the federal statement to this effect follow below.[6]

> *In recognition of increasing disaster risks and financial challenges associated with maintaining Heavy Urban Search and Rescue (HUSAR) capacities, Budget 2016 provided $3.1 million annually and ongoing to establish the HUSAR Program as part of the Government's commitment to build safer and more resilient communities.*
>
> *To help bolster existing HUSAR capacity, Public Safety Canada has committed to re-instating funding to HUSAR Task Forces in Vancouver (British Columbia); Toronto (Ontario); Calgary (Alberta); and the Province of Manitoba, as well as supporting the development of HUSAR capacity in Halifax (Nova Scotia) and Montreal (Quebec).*

[6] https://www.publicsafety.gc.ca/cnt/mrgnc-mngmnt/rspndng-mrgnc-vnts/hvyrbn-srch-rsc-en.aspx

The HUSAR Program aims to maintain the HUSAR capabilities of Canadian HUSAR Task Forces in Vancouver (British Columbia); Calgary (Alberta); the Province of Manitoba; and Toronto (Ontario). The Program also aims to develop HUSAR capacity in Montreal (Quebec) and Halifax (Nova Scotia) to build critical capacity in these underserved regions.

Canada's national approach to emergency management needs to be reflective of the needs of all partners, and the changing risk environment. As growing cities, aging infrastructure and climate variability increase across the country, ensuring sufficient HUSAR capacity is increasingly important.

This program will:

- *Support provinces and municipalities in obtaining the equipment and specialized training needed to sustain HUSAR capacity;*
- *Support investments in areas that will lead to timely and effective HUSAR response capabilities; and*
- *Support facilitating interoperability among the Task Forces.*

Federal investments will be targeted towards specific HUSAR initiatives or projects on a cost-shared ratio of 75% (federal) and 25% (provincial/other). The maximum federal contribution is 75% of the cost of a HUSAR project.

3.4 Recommendations: Service Types and Level of Service

1. Replace Administrative Order Number 24 (some of the content is no longer applicable to the Halifax Regional Municipality) and the Service Delivery Standards with a single, comprehensive order that represents the circumstances of the municipality including
   a) detailed authorization of emergency service types and levels, as shown in Table 4 below;
   b) assigning responsibility for fire prevention and public education activities that will be undertaken by the fire department;
   c) annually, review call types with historically low occurrences to determine the most operationally effective and cost-effective method of providing that service to the community—a business case should be prepared for council's consideration that includes associated equipment, training, and staffing for HRFE to provide the service versus contracting the service to another agency or private contractor, where available;
   d) training HRFE firefighters to the awareness level for services provided by third-party suppliers;
   e) continually reviewing the frequency of responses being delivered by third-party suppliers for cost-effectiveness; and
   f) detailed definitions of the service types to ensure consistent, accurate tracking of response types by the fire department and third-party service providers.

Table 4: Recommended Service Types and Levels of Service

Service Type	Service Level	Provided by HRFE	Third-party Service Provider
Structure Fires		✓	
Medical Response		✓	
Vehicle Rescue		✓	
Water Rescue		✓	
Ice Rescue		✓	
Hazardous Materials/CBRN		✓	
Search and Rescue		✓	
Marine Firefighting	Awareness		✓DND/Coast Guard
Wildland Firefighting	Operational	✓	
Confined Space Rescue	Technical		
High Angle Rescue	Technical		
Heavy Equipment/Machinery Rescue	Technical		
Trench Rescue	Technical		
HUSAR	Technical		

2. Halifax Regional Fire & Emergency should participate in the federal HUSAR initiative to provide response capabilities to the regional municipality, surrounding communities, and nationally as needed.

3. Upon approval by council of the service types and levels to be delivered to the community, Halifax Regional Fire & Emergency should engage in a Systematic Approach to Training (SAT) that includes the following:

   a) Analyzing (task analysis) the fire service's training needs compared to NFPA standards, such as

      i. Firefighter 1001 Level I & II
      ii. Fire Officer – all levels
      iii. Pre-Incident Planning
      iv. Specialty services such as NFPA 1006 Auto Extrication, Confined Space Rescue, etc.
      v. HAZMAT NFPA 472
      vi. Public Education
      vii. Fire Prevention
      viii. Fire Investigation

   b) Designing the required training strategies (human resources, props, courses, methodologies, etc.)

   c) Physically implementing training across the entire department in a coordinated fashion

   d) Evaluating and validating the training that is delivered against the needs and circumstances of the region

   e) Revising/adapting the fire service training on a regular basis to ensure the task analysis is current

Section 4 Meeting the 2006 Standards

Section 3 addressed Service Type (the kind of incident to which HRFE should respond) and Service Level (the level of expertise that HRFE can deliver to the incident: awareness; operational; technical). A requirement of this study is to "Evaluate HRFE's performance and ability to meet standards as defined in *Service Delivery Standards for Halifax Regional Fire & Emergency Service* (2006)." This section addresses the swiftness with which HRFE can, or should, arrive at various incident types in order to deliver service and expertise.

This task was to be accomplished through an analysis of response trends over three to five years. However, the historical incident data, particularly for earlier years, have numerous errors that cause inaccurate results, including

- inconsistent or missing incident type coding;
- blank time stamp records;
- the same notification time (dispatch time) and en route time, which would mean that firefighters were notified and the fire trucks were leaving the station at the same moment—possible but highly unlikely;
- the same en route time and on scene time, which means the fire truck departs and arrives at the emergency at the same moment;
- on scene time earlier than en route time, which means the fire truck arrived at the incident before it departed the station;
- no apparatus type selected; and
- dispatch to turnout times of between 1 and 20 seconds.

Therefore, only 2016 and 2017 incident data were considered somewhat acceptable for statistics analysis.

The availability of consistently captured, reliable, statistical data is critical to accurate performance measurement. This has been a long-standing concern for Halifax Regional Fire & Emergency.

- A Fire Dispatching Operational Review report, conducted by Pomax (March 2015), identified the requirements of an optimum dispatch system for Halifax Regional Fire & Emergency. Recommendations from the Fire Dispatching Operational Review report, which can be found in Appendix C of this report, included implementing a quality management program (Appendix C #13), and making a number of technological and process changes, all of which contribute to the ability to collect accurate incident data.
- In relation to establishing the existing service delivery standards, the report to Council titled *Service Delivery Standards for Halifax Regional Fire & Emergency* document, approved in 2006, states that "15% of the data, which was suspect, was eliminated from the final analysis."
- Data reliability has been a chronic problem.

The 2015 report by Pomax states that an optimum dispatch system, as part of a vision and critical to the successful operation of the fire service and dispatch service provided by the Integrated Emergency

Services communications centre, should develop and encompass the following characteristics, processes, and capabilities:

> *The system demonstrates a focus on excellence in the provision of emergency dispatch services to the citizens of the Halifax Regional Municipality.*
>
> *Integrated Emergency Services; Halifax Regional Fire & Emergency; Information, Communication, and Technology; and Halifax Regional Police operate in a team environment where quality customer service is a shared goal.*
>
> *Halifax Regional Fire & Emergency; Integrated Emergency Services; and Information, Communication, and Technology interact with open communication lines and a collaborative problem-solving methodology.*
>
> *Appropriate and defined service delivery standards are established, understood, and adhered to by all agencies.*
>
> *Performance is measured against defined performance standards and the allied agencies commit to a continuous improvement process.*
>
> *Decisions to establish new services or to change current policies or procedures are made based on measurable criteria and evaluation and collaborative decision making.*
>
> *Staff of Integrated Emergency Services; Halifax Regional Fire & Emergency; and Information, Communication, and Technology maintain their currency of knowledge and skills appropriate to their responsibilities within the dispatch system.*
>
> *The responsible parties demonstrate a comprehensive knowledge of the technology and related applications employed in the dispatch process, including awareness of new developments and technical updates available to Halifax Regional Municipality operations.*

Recommendations were made within the Fire Dispatching Operational Review report to assist Halifax Regional Municipality to build an optimum dispatch system, over a reasonable period of time, with consideration given to the complexities and costs of the identified activities.

A fundamental function of any dispatch service is accurate record keeping upon which decision making can be based. There are few indications that the Integrated Emergency Services[7] (IES) and Halifax Regional Fire & Emergency are making progress in implementing previously recommended enhancements and quality control measures, and there may be several reasons for apparent lack of evolvement. For example,

- some recommendations may not have been accepted;
- funding may not be available;
- there may be more pressing regional or Integrated Emergency Services priorities; or
- resources may not be available within IES or HRFE.

[7] Integrated Emergency Services is part of the Halifax Police Services and is the communications centre for police and fire.

4.1 Data Background

- The original 2016–2017 data files included 49,790 records of all call types.
- The intent of the data review was to assess all calls dispatched as emergencies based on the first arriving apparatus and, in the case of stations 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18, the time it took for a full assignment of 12 personnel to assemble.
- The following incident types were filtered out since they were not considered to be emergencies:
  - citizen assist
  - service call
  - investigation
  - lock out/lock in
  - minor spill/leak
  - water problem
- Vehicles types filtered out were
  - command
  - rehab
  - decon unit
  - brush vehicles
  - utility
  - rescue boats
  - captain and commander
  - tactical
  - off highway
  - Hubbard
  - Mnt. Un
  - Enfield
  - health and safety officer
  - mobile command
- The balance of incidents was then sorted by district, vehicle, incident type, station, and crew type (career, volunteer, E Platoon).
- 90th percentile performance[8] was determined for
  - dispatch activities, turnout time, and response time
- Dispatch activities were sorted by
  - Incident Begin Time to Time Queued (IBT to TQ)
  - Time Queued to Dispatch Time/Date (TQ to DTD)

[8] 90th percentile represents the time within which the measured activity was performed in 90% of incidents. Therefore, 90% of the time the activity took less time than the value indicated, and 10% of the time it took longer. 90th percentile is a common standard used to measure emergency service performance.

  - Incident Begin Time to Dispatch Time/Date (IBT to DTD)
- Dispatch time fields that showed an IBT to TQ time of 5 minutes or greater were filtered out because they were considered to be either a mistake in capturing the correct time or not an emergency. Other sections of the record that were valid were used in other calculations.
- Dispatch time fields that showed a TQ to DTD of 5 minutes or greater were filtered out because they were considered to be either a mistake in capturing the correct time or not an emergency. Other sections of the record that were valid were used in other calculations.
- Dispatch time fields that showed an IBT to DTD of 7 minutes or greater were filtered out because they were considered to be either a mistake in capturing the correct time or not an emergency. Other sections of the record that were valid were used in other calculations.
- 90th percentiles, relative to the 2006 Standard, were determined by
  - filtering by district,
  - using Excel MIN equation to find earliest dispatch per incident,
  - using Excel IF equation to indicate 1st dispatched per incident,
  - filtering for 1st dispatched vehicles only,
  - filtering for correct stations,
  - applying conditional formatting to indicate duplicate incident numbers,
  - filtering for unique data so that only the earliest activity time was considered per incident, and
  - 90th percentile calculated.

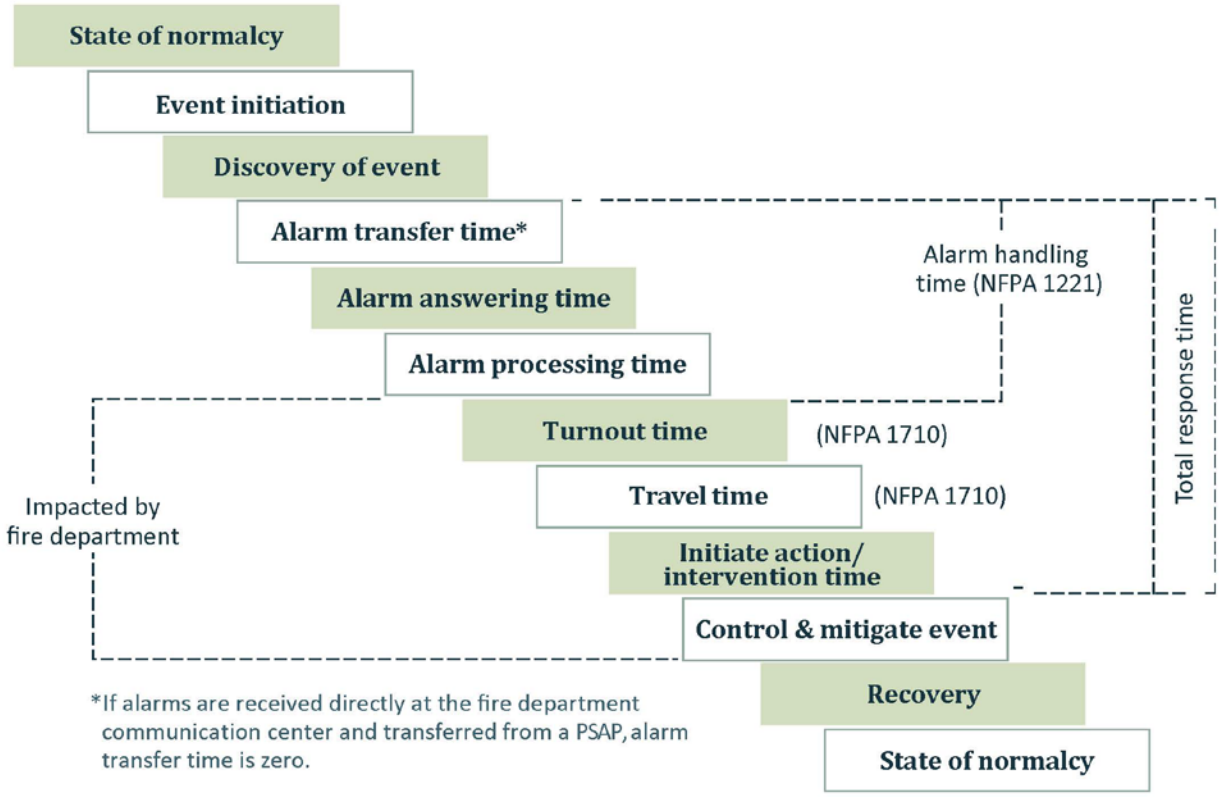
4.2 2006 service delivery standards Performance Analysis

The *Service Delivery Standards for Halifax Regional Fire & Emergency* (Appendix D), approved in 2006, uses population densities of over 100 persons and under 100 persons, per square kilometre, to define the applicable service delivery (Table 1, page 3).

Exhibit 3 to Exhibit 7 indicate the 90th percentile for each component of an incident, based on useable records, as described above, for districts and stations 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18. The 90th percentile indicates that, based on useable records, 90% of the referenced incidents for the call phase being measured occurred within the time shown.

The information in this section is part of what the NFPA refers to as the “Cascade of Events” of an incident, as demonstrated in Exhibit 2 (reproduced from Figure A.3.3.53.6, NFPA 1710-16).

Exhibit 2: NFPA Cascade of Events



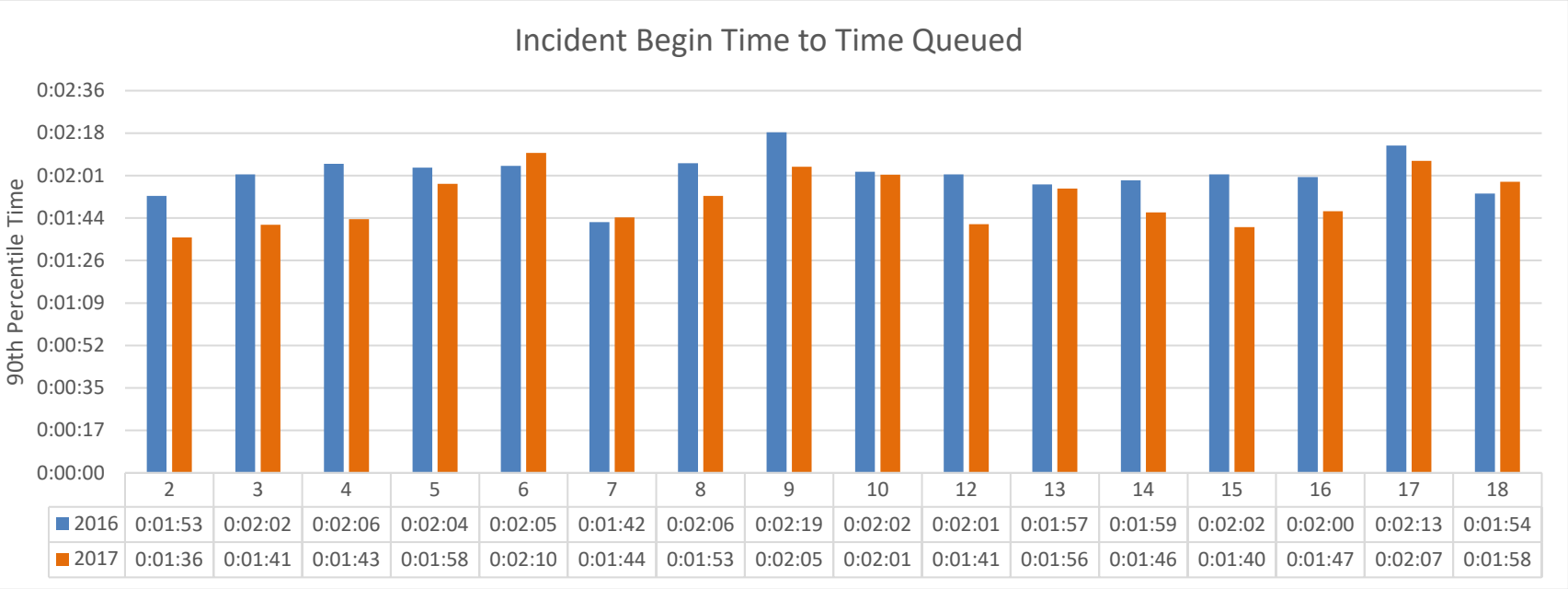
There are two distinct activities that consume time before firefighters are notified of an emergency:

- IBT to TQ performance, which is the period from when a call for assistance is first received by the Integrated Emergency Services call taker to when it is transferred to, and received by, the dispatcher (Exhibit 3); and
- TQ to DTD, which is the period from when a dispatcher is first notified of an emergency to be dispatched, to the time that responders are notified to respond (Exhibit 4).

Although the 2006 Standard is silent on a benchmark to be used in measuring the duration of each activity, identifying the intervals can assist in determining if quality improvement might reduce the time the public waits for emergency assistance.

In Exhibit 2, above, these two activities are depicted as Alarm Transfer Time, Alarm Answering Time, and Alarm Processing Time.

Exhibit 3: 90th Percentile Incident Begin to Time Queued by Station in 2016 and 2017



	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	18
2016	0:01:53	0:02:02	0:02:06	0:02:04	0:02:05	0:01:42	0:02:06	0:02:19	0:02:02	0:02:01	0:01:57	0:01:59	0:02:02	0:02:00	0:02:13	0:01:54
2017	0:01:36	0:01:41	0:01:43	0:01:58	0:02:10	0:01:44	0:01:53	0:02:05	0:02:01	0:01:41	0:01:56	0:01:46	0:01:40	0:01:47	0:02:07	0:01:58

Definition of 90th percentile IBT to TQ:

- the period from when a call for assistance is first received by the Integrated Emergency Services call taker to when it is transferred to, and received by, the dispatcher.

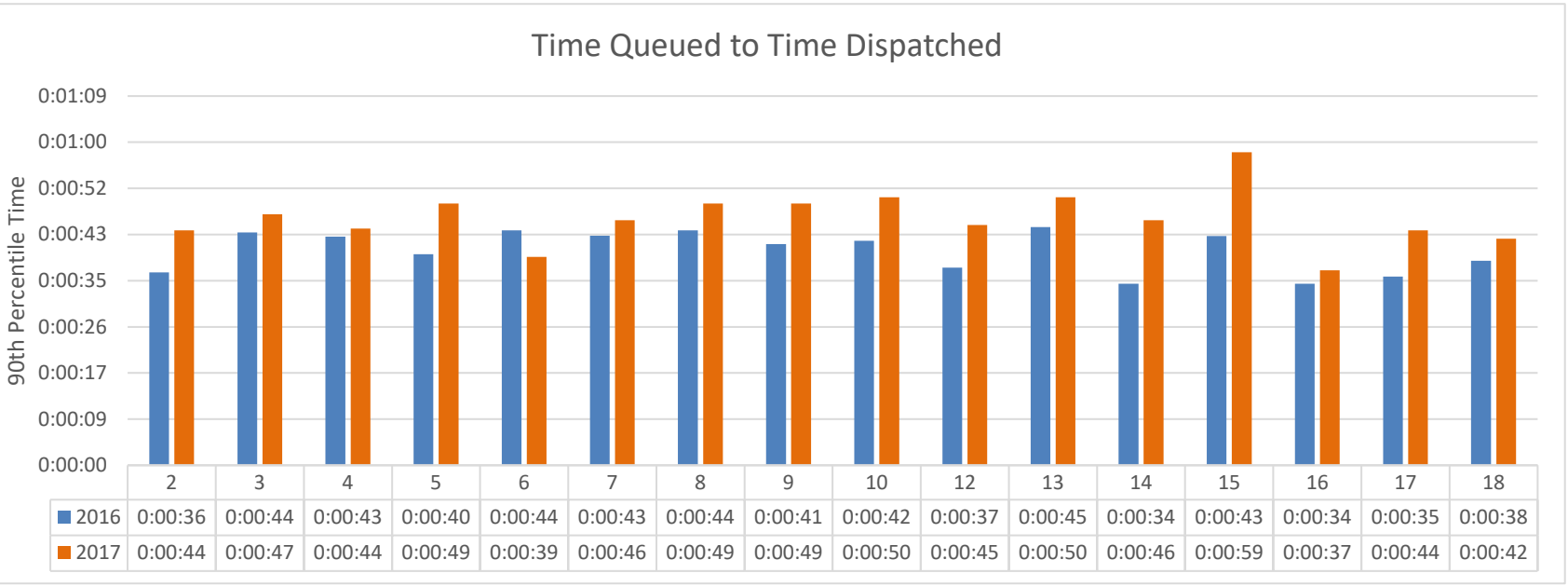
The 90th percentile Incident Begin Time to Time Queued Time for career stations

- in 2016, ranged from a low of 00:01:42 minutes (station 7) to a high of 00:02:19 minutes (station 9), and
- in 2017, ranged from a low of 00:01:36 minutes (station 2) to a high of 00:02:10 minutes (station 6).

The 2006 standard does not define a benchmark to be used in measuring Incident Begin Time to Time Queued, but identifying the duration can assist in determining if quality improvement might reduce the time the public waits for emergency assistance.

TQ to DTD performance (Exhibit 4) is the time during which a dispatcher determines whether the station and apparatus response configuration, suggested by the computer aided dispatch, is acceptable, and starts the firefighter notification process.

Exhibit 4: 90th Percentile Time Queued to Dispatch Time



	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	18
2016	0:00:36	0:00:44	0:00:43	0:00:40	0:00:44	0:00:43	0:00:44	0:00:41	0:00:42	0:00:37	0:00:45	0:00:34	0:00:43	0:00:34	0:00:35	0:00:38
2017	0:00:44	0:00:47	0:00:44	0:00:49	0:00:39	0:00:46	0:00:49	0:00:49	0:00:50	0:00:45	0:00:50	0:00:46	0:00:59	0:00:37	0:00:44	0:00:42

Definition of 90th percentile Time Queued to Dispatch Time:

- the period from when a dispatcher is first notified of an emergency to be dispatched to the time that the dispatcher notifies responders to respond.

The 90th percentile Time Queued to Dispatch Time for career stations

- in 2016, ranged from a low of 34 seconds (stations 14 and 16) to a high of 45 seconds (station 13), and
- in 2017, ranged from a low of 37 seconds (station 16) to a high of 50 seconds (station 10 and 13).

The 2006 standard does not define a benchmark to be used in measuring Time Queued to Dispatch Time, but identifying the duration can assist in determining if quality improvement might reduce the time the public waits for emergency assistance.

4.3 Dispatch Time

The 2006 service delivery standards states

> *Halifax Regional Fire & Emergency will establish a standard which will see a Dispatch Time of 60 seconds or less, 90% of the time, for all fire protection districts.*
>
> *A one-minute (60 second) Dispatch Time would be in accordance with the NFPA 1710 recommendation, for fire protection districts with a population density of over 100 persons per square kilometer.*
>
> *A one-minute (60 second) Dispatch Time would be in accordance with the NFPA 1720 recommendation, for fire protection districts with a population density under 100 persons per square kilometer. For structural incidents, this will include a minimum dual station response (Automatic-Aid).*

Dispatch time is defined in Appendix A of the 2006 Standard as

> ***Dispatch Time**: The point of receipt of the emergency alarm at the public safety answering point, to the point where sufficient information is known to the Dispatcher and applicable units are notified of the emergency.*

This standard is equivalent to the *Incident Begin Time to Time Queued* **plus** *Time Queued to Dispatch Time* shown in Exhibit 3 and Exhibit 4. The 90th percentile for dispatch time, as defined in the 2006 Standards, is shown in Exhibit 5.

For the purpose of this report, dispatch time results are shown for

- core stations (stations 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18) in Exhibit 5; and
- fire protection districts that have a population density of under 100 persons per square kilometre (districts 11, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 33, 34, 35, 36, 38, 39, 40, 41, 42, 43, 45, 47, 48, 50, 52, 54, 55, 56, 58, 60, 63, and 65) on page 34.

Within this report, statistical information is provided for

- the core fire districts and stations; specifically, districts and stations 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18; and
- for rural districts and stations; specifically, districts and stations 11, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 33, 34, 35, 36, 38, 39, 40, 41, 42, 43, 45, 47, 48, 50, 52, 54, 55, 56, 58, 60, 63, and 65.

It is important to note that stations 45 and 58 are included in the rural district list of stations yet serve population areas with densities much greater than 100 persons per square kilometre, even though some of the response area is rural (please see Table 1). However, stations 45 and 58 are composite fire stations, which means that they are staffed by a combination of career firefighters supported by volunteers. Therefore, those stations, for the purpose of response time and other calculations, have been included with rural stations. The 2006 Standards references response and performance criteria for those occasions

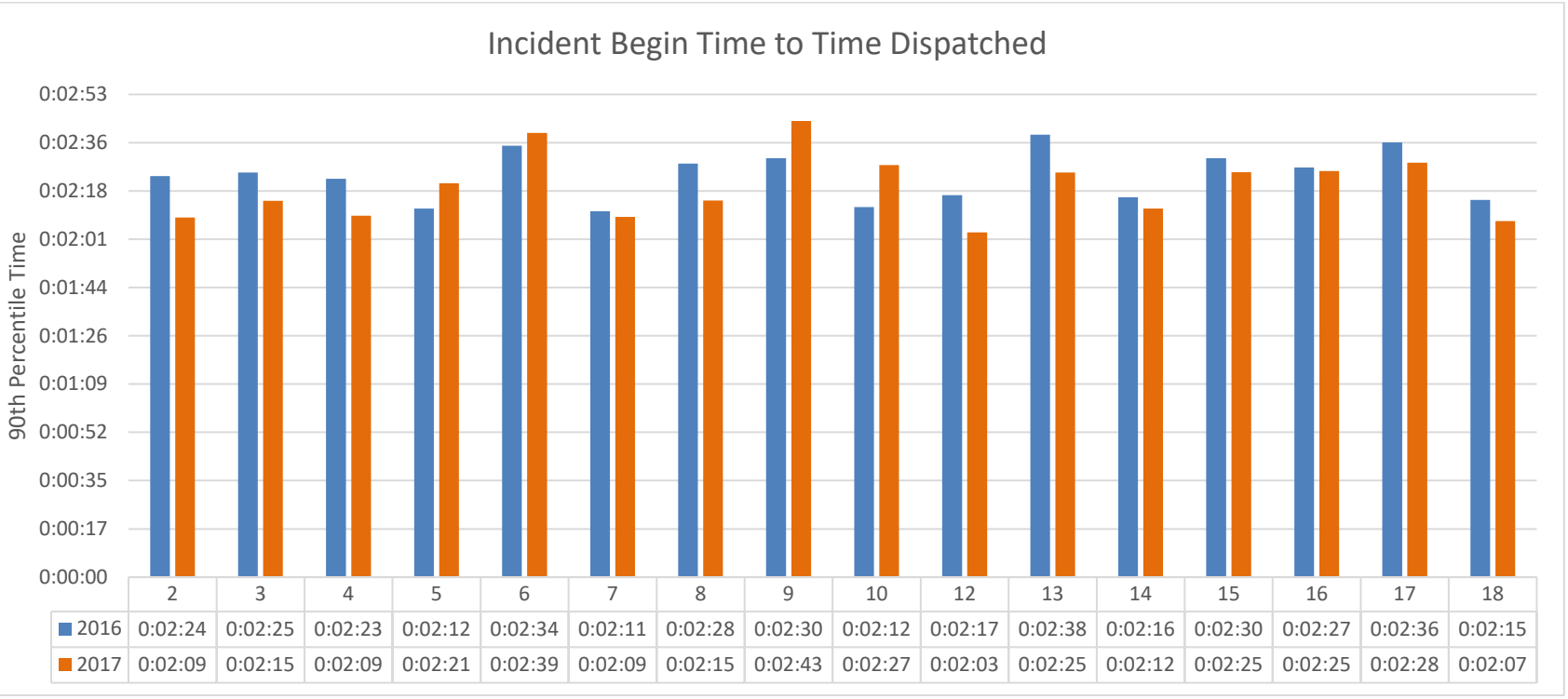
when career staff are on duty at composite stations, and we have applied those standards where appropriate.

Station 11, although staffed on a 24-hour basis with 2 personnel, is included as a rural district with a population density of less than 100 persons per square kilometre.

Finally, on occasion, stations 45 and 58 may be referred to as being within a group of stations or districts serving population densities of fewer than 100 persons per square kilometre. It should be clear that population densities within districts 45 and 58 are much greater, but they might be included in that category

- for the purpose of defining performance, and
- whether stations meet standards, and
- because they are composite stations.

Exhibit 5: Dispatch Time 2016–2017 by Station



	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	18
2016	0:02:24	0:02:25	0:02:23	0:02:12	0:02:34	0:02:11	0:02:28	0:02:30	0:02:12	0:02:17	0:02:38	0:02:16	0:02:30	0:02:27	0:02:36	0:02:15
2017	0:02:09	0:02:15	0:02:09	0:02:21	0:02:39	0:02:09	0:02:15	0:02:43	0:02:27	0:02:03	0:02:25	0:02:12	0:02:25	0:02:25	0:02:28	0:02:07

The 90th percentile Incident Begin Time to Dispatch Time for career stations

- in 2016, ranged from a low of 0:02:11 minutes (station 7) to a high of 0:02:38 minutes (station 13), and
- in 2017, ranged from a low of 0:02:03 minutes (station 12) to a high of 0:02:43 minutes (station 9).

Overall, for the core stations (2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18), the 90th percentile dispatch time was 141 seconds in 2016 and 135 seconds in 2017: 81 seconds and 75 seconds, respectively, above the standard of 60 seconds.

Section 7.4.2 of the 2016 edition of NFPA 1221, Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems states

> "With the exception of the call types identified in 7.4.2.2, 90 percent of emergency alarm processing shall be completed within 64 seconds, and 95 percent of alarm processing shall be completed within 106 seconds. *(For documentation requirements, see 12.5.2.)"*

Section 7.4.2.2. states

> "Emergency alarm processing for the following call types shall be completed within 90 seconds 90 percent of the time and within 120 seconds 99 percent of the time:
>
> (1) Calls requiring emergency medical dispatch questioning and pre-arrival medical instructions
> (2) Calls requiring language translation
> (3) Calls requiring the use of a TTY/TDD device or audio/ video relay services
> (4) Calls of criminal activity that require information vital to emergency responder safety prior to dispatching units
> (5) Hazardous material incidents
> (6) Technical rescue
> (7) Calls that require determining the location of the alarm due to insufficient information
> (8) Calls received by text message"

In 2016, the dispatch time was 57% above the 90-second mark stated in NFPA 1221 – 7.4.2.2; in 2017, it was 50% higher.

4.4 Turnout Time

Turnout time, in the 2006 Delivery Standard, is defined as follows:

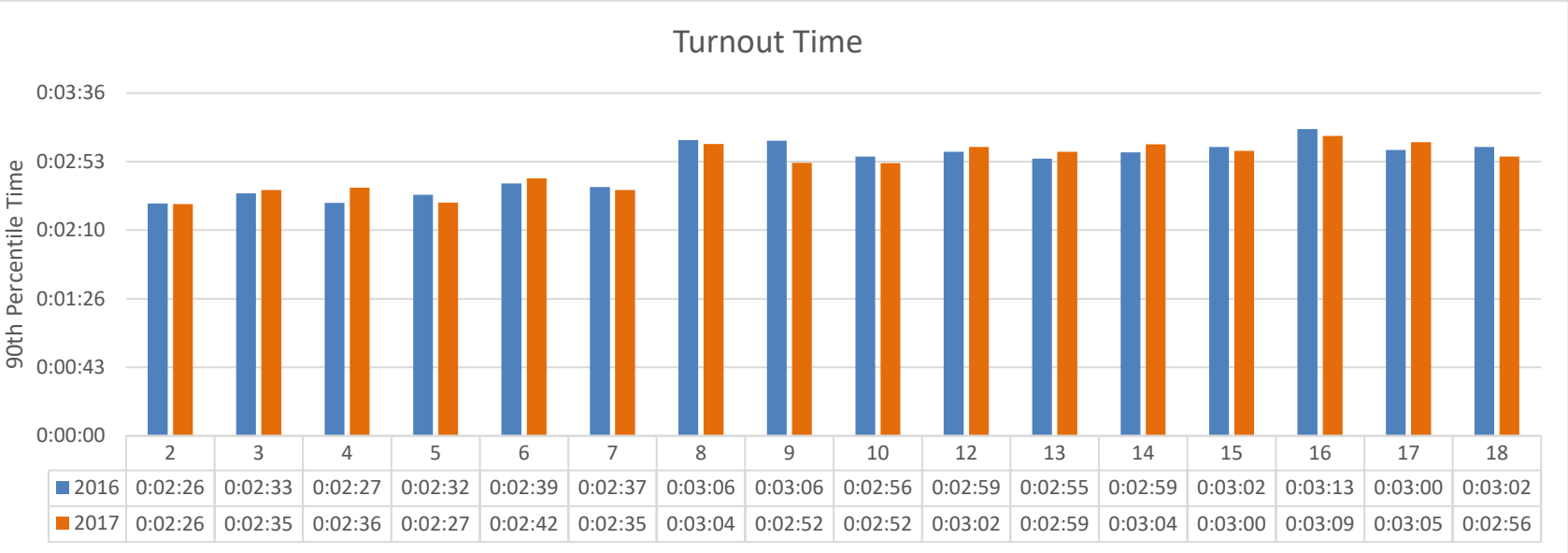
> *Turnout Time: The time interval from the receipt of the call notification by the station(s) or apparatus, until the time the apparatus notifies the Dispatch Centre that they are en route to the call.*

The standard for fire protection districts with population density exceeding 100 persons per square kilometre is 60 seconds, 90% of the time (stations 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18). The 2016 and 2017 turnout times, by station, are shown in Exhibit 6.

Turnout is affected by several factors—for example,

- fire station design and travel routes to apparatus;
- activities of the firefighters at the time of the alarm (training, maintenance responsibilities, location within or outside the fire station);
- department policies regarding donning of bunker gear and procedures for firefighter safety (donning breathing apparatus, seat belts) prior to the initiation of travel time; and
- firefighter understanding and acceptance of performing optimally in each phase of response to minimize total response times.

Exhibit 6: Turnout Time 2016–2017 by Station



	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	18
2016	0:02:26	0:02:33	0:02:27	0:02:32	0:02:39	0:02:37	0:03:06	0:03:06	0:02:56	0:02:59	0:02:55	0:02:59	0:03:02	0:03:13	0:03:00	0:03:02
2017	0:02:26	0:02:35	0:02:36	0:02:27	0:02:42	0:02:35	0:03:04	0:02:52	0:02:52	0:03:02	0:02:59	0:03:04	0:03:00	0:03:09	0:03:05	0:02:56

The 90th percentile Turnout Time for career stations

- in 2016, ranged from a low of 0:02:26 minutes (station 2) to a high of 0:03:13 (station 16), and
- in 2017, ranged from a low of 0:02:26 minutes (station 2) to a high of 0:03:09 (station 16).

In 2016 and 2017 the core stations achieved the 60-second, 90th percentile turnout standard 9.6% of the time.

The overall 90th percentile turnout time for core stations (2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18) was 170 seconds in 2016 and 171 seconds in 2017: 110 seconds and 111 seconds, respectively, above the standard of 60 seconds.

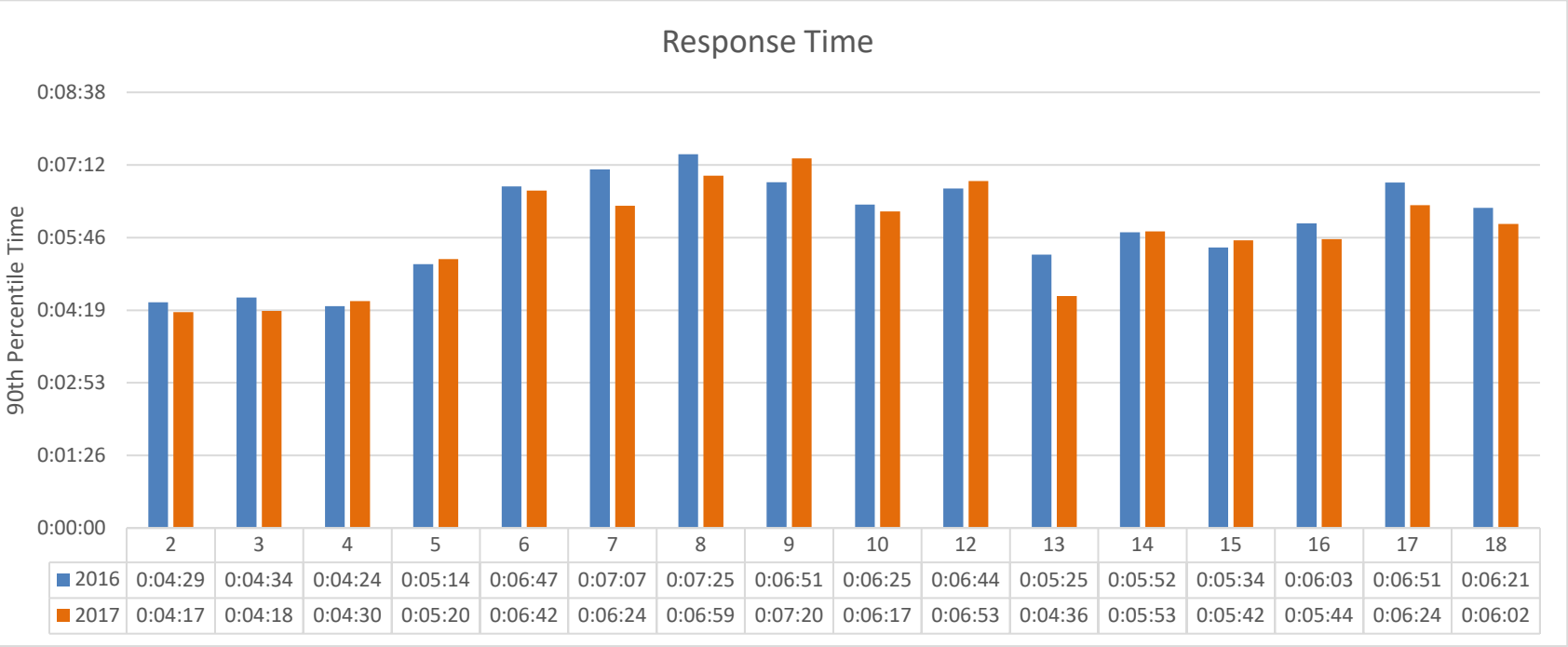
4.5 Response Time

Response time, in the 2006 Delivery Standard, is defined as

> *Response Time: The time that begins when units are en route to the emergency incident and ends when units arrive at the scene.*

The standard for fire protection districts with population density exceeding 100 persons per square kilometre is 5 minutes or less, 90% of the time (stations 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18).

Exhibit 7: Response Time 2016–2017 by Station



	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	18
2016	0:04:29	0:04:34	0:04:24	0:05:14	0:06:47	0:07:07	0:07:25	0:06:51	0:06:25	0:06:44	0:05:25	0:05:52	0:05:34	0:06:03	0:06:51	0:06:21
2017	0:04:17	0:04:18	0:04:30	0:05:20	0:06:42	0:06:24	0:06:59	0:07:20	0:06:17	0:06:53	0:04:36	0:05:53	0:05:42	0:05:44	0:06:24	0:06:02

The 90th percentile Depart Station to Arrive Incident (Response Time) for career stations, for the first arriving vehicle

- in 2016, ranged from a low of 0:04:24 minutes (station 4) to a high of 0:07:25 minutes (station 8), and
- in 2017, ranged from a low of 0:04:17 minutes (station 2) to a high of 0:07:20 minutes (station 9).

Overall, for the core districts (2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18), the 90th percentile response time was 00:06:07 minutes in 2016, and 00:06:02 minutes in 2017: 67 seconds and 62 seconds, respectively, above the standard of 5 minutes.

Districts 2, 3, and 4 achieved the 5-minute, 90th percentile response standard in 2016 and 2017, and district 13 met the standard in 2017.

4.5.1 2016–2017 Structure Fires Initial Response

The 2006 time standards apply to all types of incidents. However, dispatch, turnout, and response time compliance with the 2006 Standards were also assessed based on structure fires only. Reported structure fires include incidents coded as

- 101 – Structure Fire – Major,
- 102 – Structure Fire – Minor, Rm/bldg., and
- 103 – Structure contents only fire.

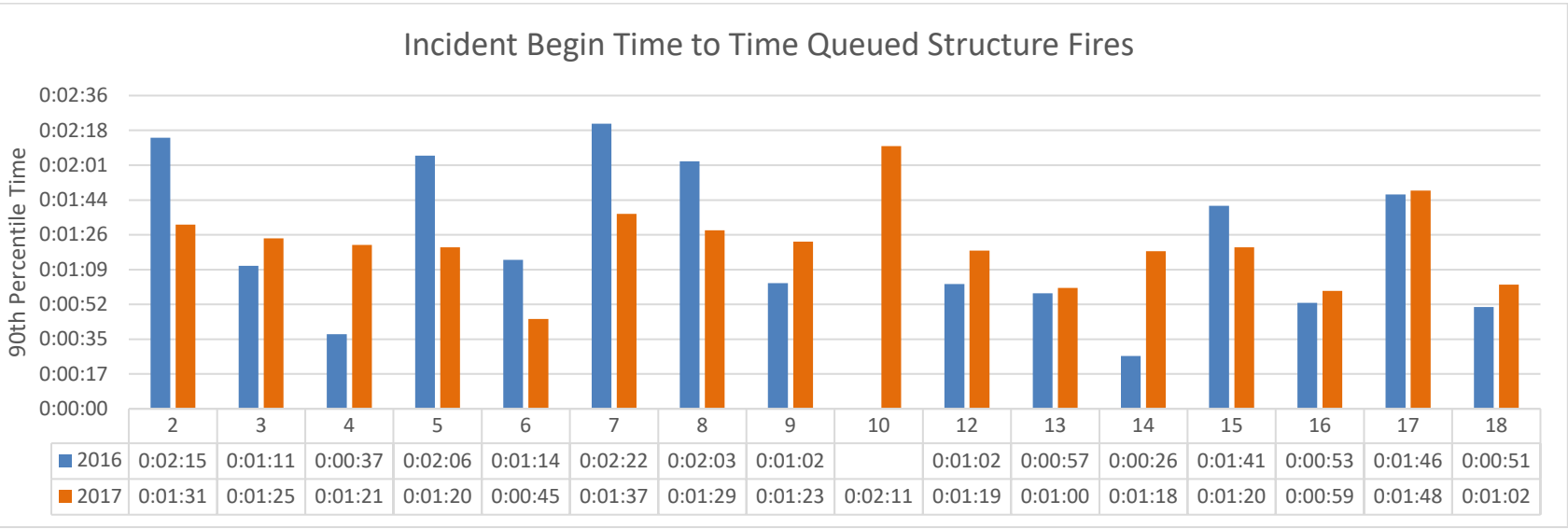
Exhibit 8 to Exhibit 12 provide information with respect to first truck response to incidents reported as structure fires in fire protection districts with population density exceeding 100 persons per square kilometre (core districts 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18). Districts with no data indicate that there were no incidents in that district or that data were not useable.

Although the 2006 Standards is silent on a benchmark to be used in measuring the duration of IBT to TQ and TQ to DTD performance, identifying the intervals can assist in determining if quality improvement might reduce the time the public waits for emergency assistance.

As a reminder, the 2006 HRFE service delivery standards state:

A	Fire protection districts with population density over 100 persons per square kilometre
1	A dispatch time of 60 seconds, 90% of the time
2	A turnout time of 60 seconds, 90% of the time
3	A response time of 5 minutes or less, 90% of the time, for single unit responses, or for the first arriving unit of a multiple unit response regardless of the nature of the emergency service to be provided
4	A response time of 8 minutes or less, 90% of the time, for subsequent arriving units of a multiple unit response or alarm assignment dispatched with the first arriving apparatus

Exhibit 8: Structure Fires – 90th Percentile Incident Begin to Time Queued by Station in 2016 and 2017



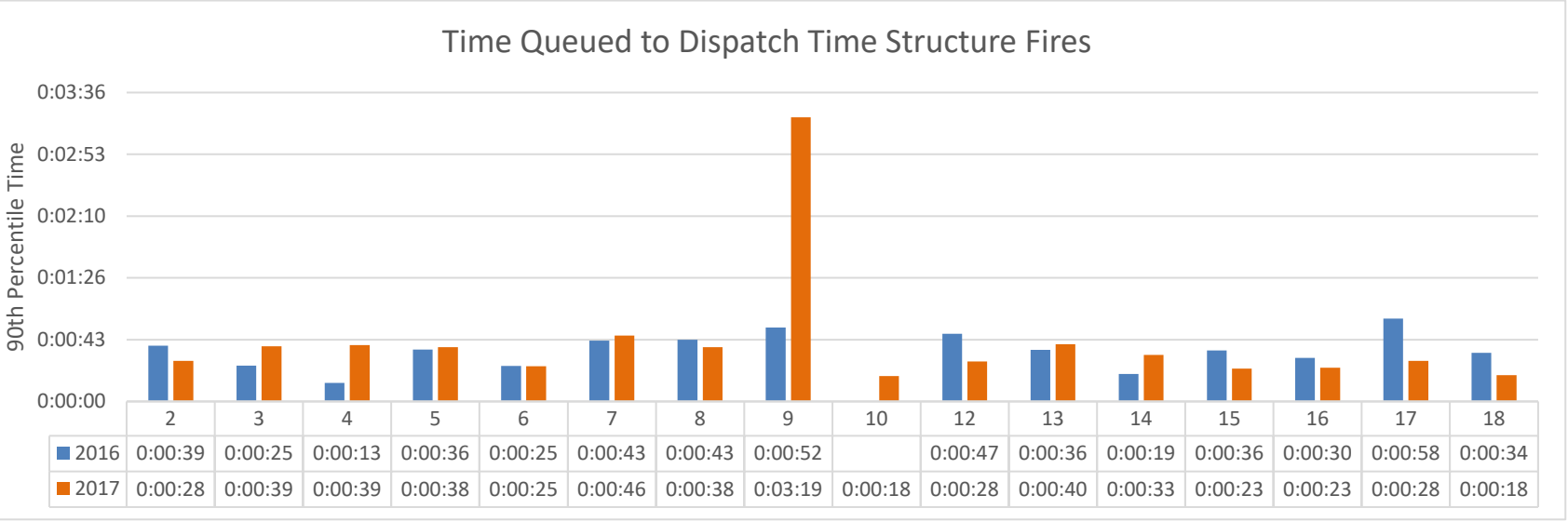
	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	18
2016	0:02:15	0:01:11	0:00:37	0:02:06	0:01:14	0:02:22	0:02:03	0:01:02		0:01:02	0:00:57	0:00:26	0:01:41	0:00:53	0:01:46	0:00:51
2017	0:01:31	0:01:25	0:01:21	0:01:20	0:00:45	0:01:37	0:01:29	0:01:23	0:02:11	0:01:19	0:01:00	0:01:18	0:01:20	0:00:59	0:01:48	0:01:02

The 90th percentile Incident Begin Time to Time Queued Time for core districts

- in 2016, ranged from a low of 37 seconds (station 4) to a high of 00:02:15 minutes (station 2), and
- in 2017, ranged from a low of 45 seconds (station 6) to a high of 00:01:48 minutes (station 17).

The 2006 standard does not define a benchmark to be used in measuring Incident Begin Time to Time Queued, but identifying the duration can assist in determining if quality improvement might reduce the time the public waits for emergency assistance.

Exhibit 9: Structure Fires – 90th Percentile Time Queued to Dispatch Time



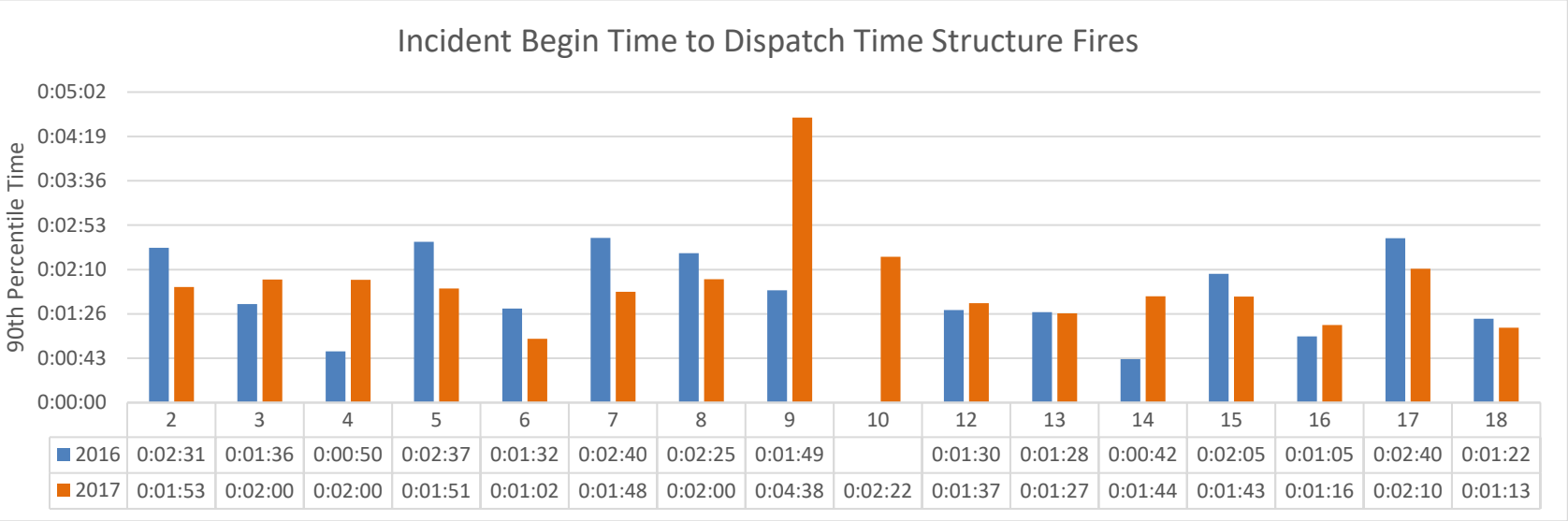
	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	18
2016	0:00:39	0:00:25	0:00:13	0:00:36	0:00:25	0:00:43	0:00:43	0:00:52		0:00:47	0:00:36	0:00:19	0:00:36	0:00:30	0:00:58	0:00:34
2017	0:00:28	0:00:39	0:00:39	0:00:38	0:00:25	0:00:46	0:00:38	0:03:19	0:00:18	0:00:28	0:00:40	0:00:33	0:00:23	0:00:23	0:00:28	0:00:18

The 90th percentile Time Queued to Dispatch Time for core districts

- in 2016, ranged from a low of 13 seconds (station 4) to a high of 58 seconds (station 17), and
- in 2017, ranged from a low of 18 seconds (station 10) to a high of 3 minutes and 19 seconds (station 9).
  - The high 90th percentile at station 9 is attributable to incident number HF17-8804, which indicates that it took 4 minutes and 10 seconds to alert the initial responding station. The protracted time could be due to an error in time recording or another reason.

The 2006 standard does not define a benchmark to be used in measuring Time Queued to Dispatch Time, but identifying the duration can assist in determining if quality improvement might reduce the time the public waits for emergency assistance.

Exhibit 10: Structure Fires – 90th Percentile Incident Begin Time to Dispatch Time



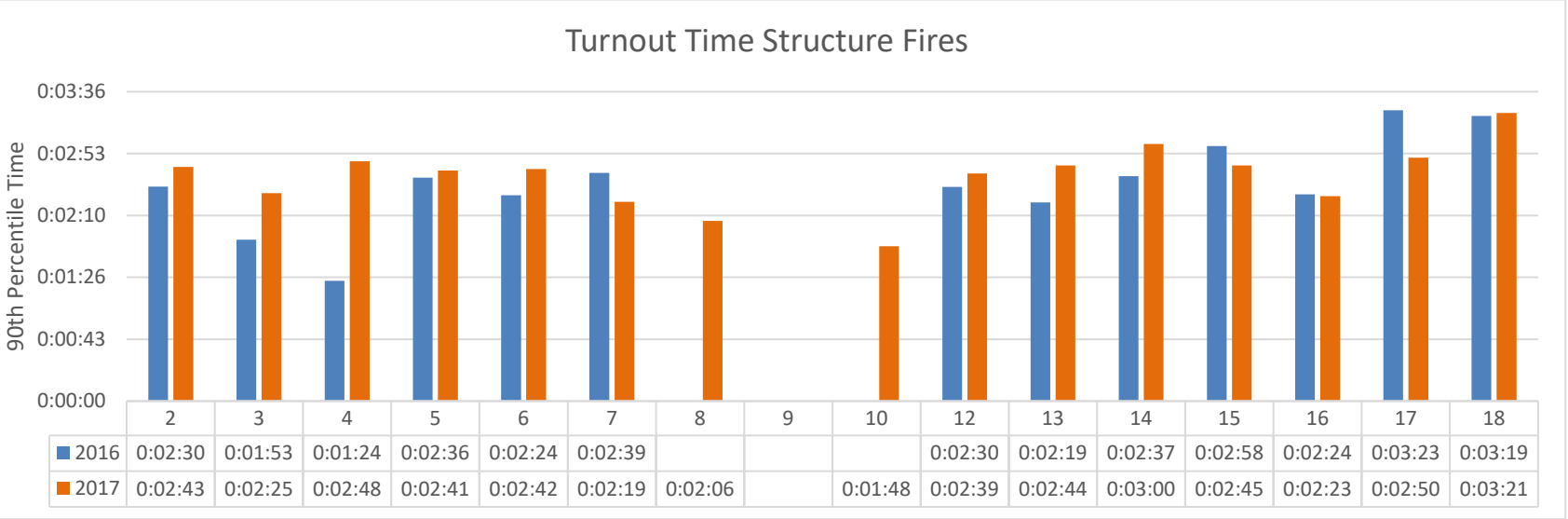
	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	18
2016	0:02:31	0:01:36	0:00:50	0:02:37	0:01:32	0:02:40	0:02:25	0:01:49		0:01:30	0:01:28	0:00:42	0:02:05	0:01:05	0:02:40	0:01:22
2017	0:01:53	0:02:00	0:02:00	0:01:51	0:01:02	0:01:48	0:02:00	0:04:38	0:02:22	0:01:37	0:01:27	0:01:44	0:01:43	0:01:16	0:02:10	0:01:13

The 90th percentile Incident Begin Time to Dispatch Time for core districts

- in 2016, ranged from a low of 50 seconds (station 4) to a high of 0:02:40 minutes (station 17), and
- in 2017, ranged from a low of 0:01:02 minutes (station 6) to a high of 0:04:38 minutes (station 9).
  - The high 90th percentile at station 9 is attributable to incident number HF17-8804, which indicates that it took 4 minutes and 10 seconds to alert the initial responding station. The protracted time could be due to an error in time recording or another reason.

Overall, for the core districts (2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18), the 90th percentile dispatch time to structure fires was 145 seconds in 2016 and 111 seconds in 2017: 85 seconds and 51 seconds, respectively, above the standard of 60 seconds.

Exhibit 11: Structure Fires – 90th Percentile Turnout Time



	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	18
2016	0:02:30	0:01:53	0:01:24	0:02:36	0:02:24	0:02:39				0:02:30	0:02:19	0:02:37	0:02:58	0:02:24	0:03:23	0:03:19
2017	0:02:43	0:02:25	0:02:48	0:02:41	0:02:42	0:02:19	0:02:06		0:01:48	0:02:39	0:02:44	0:03:00	0:02:45	0:02:23	0:02:50	0:03:21

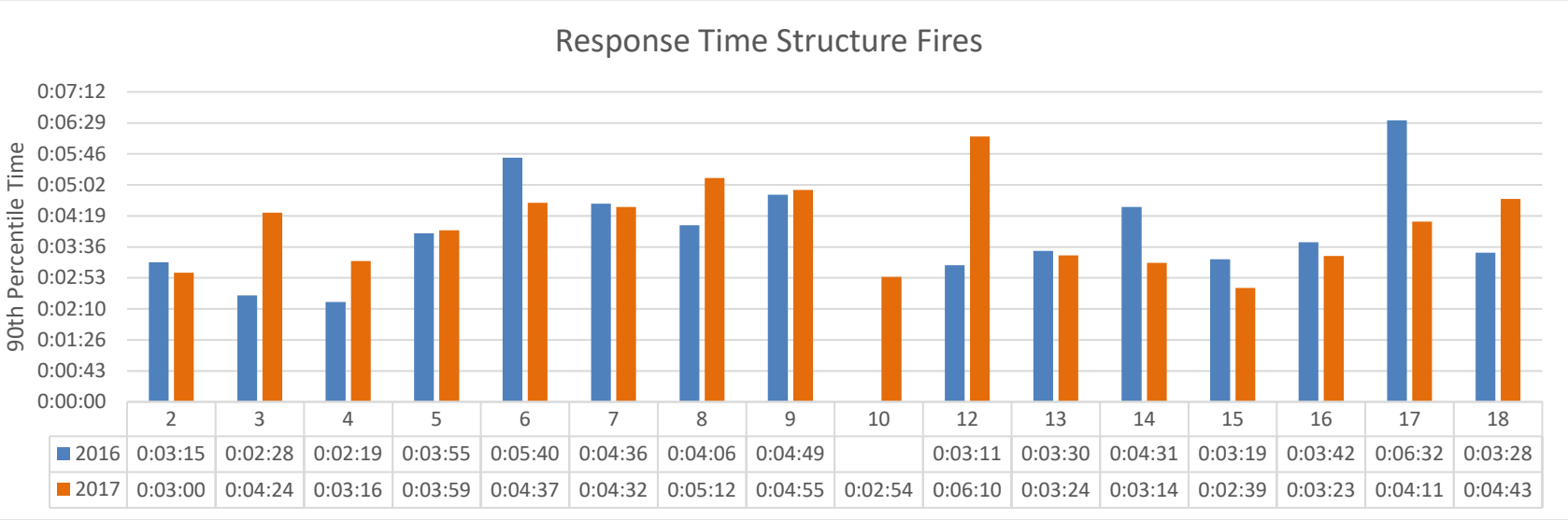
The 90th percentile Turnout Time for core districts

- in 2016, ranged from a low of 0:01:24 minutes (station 4) to a high of 0:03:23 (station 17), and
- in 2017, ranged from a low of 0:01:48 minutes (station 10) to a high of 0:03:21 (station 18).

The overall 90th percentile first truck turnout time for structure fire incidents in core districts (2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18) was 173 seconds in 2016 and 172 seconds in 2017: 113 seconds and 112 seconds, respectively, above the standard of 60 seconds.

In 2016 and 2017, the core districts achieved the 60-second, 90th percentile turnout standard 16% of the time when only structure fire incidents were measured.

Exhibit 12: Structure Fires – 90th Percentile Response Time, Initial Response



	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	18
2016	0:03:15	0:02:28	0:02:19	0:03:55	0:05:40	0:04:36	0:04:06	0:04:49		0:03:11	0:03:30	0:04:31	0:03:19	0:03:42	0:06:32	0:03:28
2017	0:03:00	0:04:24	0:03:16	0:03:59	0:04:37	0:04:32	0:05:12	0:04:55	0:02:54	0:06:10	0:03:24	0:03:14	0:02:39	0:03:23	0:04:11	0:04:43

The 90th percentile first truck Response Time for core districts

- in 2016, ranged from a low of 0:02:19 minutes (district 4) to a high of 0:06:32 (district 17), and
- in 2017, ranged from a low of 0:02:54 minutes (district 10) to a high of 0:06:10 (district 12).

The overall 90th percentile first truck response time for structure fire incidents in core districts (2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18) was 286 seconds in 2016 and 289 seconds in 2017: 14 seconds and 11 seconds, respectively, **better** than the standard of 300 seconds.

In 2016 and 2017, the core districts achieved the 5-minute (300-second), 90th percentile response standard 91% and 92% of the time when only structure fire incidents were measured.

4.5.2 2016–2017 Full Assignment for Structure Fires

An analysis was undertaken of full assignment response time to reported structure fires in the core districts only. Reported structure fires include incidents coded in the data as

- 101 – Structure Fire – Major,
- 102 – Structure Fire – Minor, Rm/bldg., and
- 103 – Structure contents only fire.

In 2016, the full assignment 90th percentile response time to structure fires in the core districts was 9 minutes and 30 seconds: 1 minute and 30 seconds above the 8-minute target.

- The 8-minute target was achieved 70% of the time.

In 2017, the full assignment 90th percentile response time to structure fires in the core districts was 10 minutes and 15 seconds: 2 minutes and 15 seconds above the 8-minute target.

- The 8-minute target was achieved 67% of the time.

4.6 Dispatch Time for Non-Core Districts

The dispatch time standard for all fire protection districts is 60 seconds, 90% of the time. Although the standard defines dispatch time as "The point of receipt of the emergency alarm at the public safety answering point, to the point where sufficient information is known to the dispatcher and applicable units are notified of the emergency," we have reported on "dispatch time" in the form of IBT to TQ and TQ to DTD. We have also shown IBT to DTD, which is the same as "dispatch time" in the 2006 Standards.

The following 90th percentile times were found in fire protection districts that have a population density of under 100 persons per square kilometre (districts 11, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 33, 34, 35, 36, 38, 39, 40, 41, 42, 43, 45, 47, 48, 50, 52, 54, 55, 56, 58, 60, 63, and 65).

In 2016

The 90th percentile time for Incident Begin time to Time Queued was 96 seconds.

The 90th percentile time for Time Queued to Dispatch Date/Time was 66 seconds.

The 90th percentile time for Incident Begin time to Dispatch Date/Time was 174 seconds. This is the Dispatch Time as defined by the 2006 standard.

- The 60-second dispatch time was achieved 56% of the time.

In 2017

The 90th percentile time for Incident Begin time to Time Queued was 90 seconds.

The 90th percentile time for Time Queued to Dispatch Date/Time was 69 seconds.

The 90th percentile time for Incident Begin time to Dispatch Date/Time was 188 seconds. This considers the dispatch time as defined by the 2006 standard.

- The 60-second dispatch time was achieved 54% of the time.

Even though the filtering process disregarded records containing mistakes in time entries, it is possible that some erroneous times remained in the data and contributed to the dispatch time 90th percentile being 190% and 213% greater than the target in 2016 and 2017 respectively.

4.7 Turnout E Platoon Monday to Friday 0700 to 1700 Hours

The 2006 Standards states that "Stations with career staff (Composite Stations) will meet the turnout time criteria of one minute or less, 90% of the time, when career staff are present."

In 2016, E Platoon staff achieved a 90th percentile turnout of 2 minutes and 58 seconds.

- The 60-second standard was achieved at the 13th percentile.

In 2017, E Platoon staff achieved a 90th percentile turnout of 3 minutes and 03 seconds.

- The 60-second standard was achieved at the 9th percentile.

4.8 Response Time E Platoon Monday to Friday 0700 to 1700 Hours

The 2006 Standards adopts a response time "…criteria of ten (10) minutes or less for the arrival of the first arriving apparatus … for fire protection districts that have a population density of under 100 persons per square kilometer."

In 2016, E Platoon staff achieved a 90th percentile response time of 9 minutes and 16 seconds: 44 seconds better than the 10-minute standard.

In 2017, E Platoon staff achieved a 90th percentile response time of 9 minutes and 09 seconds: 51 seconds better than the 10-minute standard.

4.9 Turnout by Volunteers Only

The 2006 Standards adopts a "…Turnout Time standard of six (6) minutes or less, 90% of the time for Stations 19 to 63 (Rural), when the response is by volunteer members."

In 2016, volunteer firefighters achieved a 90th percentile turnout of 7 minutes and 42 seconds.

- The 6-minute standard was achieved at the 69th percentile.

In 2017, volunteer firefighters achieved a 90th percentile turnout of 7 minutes and 48 seconds.

- The 6-minute standard was achieved at the 68th percentile.

4.10 Response Time by Volunteers Only

The 2006 Standards adopts a response time "…criteria of ten (10) minutes or less for the arrival of the first arriving apparatus … for fire protection districts that have a population density of under 100 persons per square kilometer."

In 2016, volunteer firefighters achieved a 90th percentile response time of 11 minutes and 11 seconds.

- The 10-minute standard was achieved at the 86th percentile.

In 2017, volunteer firefighters achieved a 90th percentile response time of 10 minutes and 24 seconds.

- The 10-minute standard was achieved at the 64th percentile.

4.11 Overall Turnout to Non-Core Districts

The 2006 Standards adopts a "…Turnout Time standard of six (6) minutes or less, 90% of the time for Stations 19 to 63 (Rural), when the response is by volunteer members." The overall turnout to rural districts was measured, because the first responding apparatus is sometimes from a district other than those considered rural.

In 2016, the overall 90th percentile turnout time to rural districts was 7 minutes and 01 second.

- The 6-minute standard was achieved at the 82nd percentile.

In 2017, the overall 90th percentile turnout time to rural districts was 7 minutes and 13 seconds.

- The 6-minute standard was achieved at the 81st percentile.

4.12 Overall First Vehicle Response to Non-Core Districts

The 2006 Standards adopts a response time "…criteria of ten (10) minutes or less for the arrival of the first arriving apparatus … for fire protection districts that have a population density of under 100 persons per square kilometer." The overall response to rural districts was measured, because the first responding apparatus is sometimes from a district other than those considered rural.

In 2016, the overall 90th percentile response time to rural districts was 12 minutes and 10 seconds.

- The 10-minute standard was achieved at the 81st percentile.

In 2017, the overall 90th percentile response time to rural districts was 11 minutes and 35 seconds.

- The 10-minute standard was achieved at the 83rd percentile.

4.13 Summary Tables

Exhibit 13 demonstrates the dispatch and firefighter response performance, in core districts, in relation to the applicable 2006 Standard. Red text identifies those standards that are not met; white text identifies those standards that are achieved.

Exhibit 13: Summary Information Core Districts

Districts and Stations 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18				
	2006 Standards			
	Incident Begin to Dispatch	Turnout	Response Time	Multiple Unit Response
	60 seconds or less, 90% of the time	60 seconds or less, 90% of the time	5 minutes (300 seconds) or less, 90% of the time	8 minutes (480 seconds) or less, 90% of the time
Performance 2016	141	170	367	682
Performance 2017	135	171	362	685
	Structure Fires Only, in Seconds, 90% of the time			
Performance 2016	145	173	286	570
Performance 2017	111	172	289	615

Exhibit 14, below, demonstrates the dispatch and firefighter response performance, in rural districts, in relation to the applicable 2006 Standard. Red text identifies those standards that are not met; white text identifies those standards that are achieved.

Exhibit 14: Summary Information Rural Districts

Districts and Stations 11, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 33, 34, 35, 36, 38, 39, 40, 41, 42, 43, 45, 47, 48, 50, 52, 54, 55, 56, 58, 60, 63, and 65							
2006 Standards							
	Incident Begin to Dispatch	Turnout			Response Time		
		Career Staff	Volunteers	Career and Volunteer	Career Staff	Volunteers	Career and Volunteer
	60 seconds or less	60 seconds or less	Six minutes (360 seconds) or less, 90% of the time		10 minutes (600 seconds) or less, 90% of the time	10 minutes (600 seconds) or less, 90% of the time	10 minutes (600 seconds) or less, 90% of the time
Performance 2016	174	178	462	421	556	671	730
Performance 2017	188	183	468	433	549	624	695

4.14 Conclusions

In general, the 2006 performance standards are not met **except** in the circumstances of first unit travel time (response) to structure fires in the core districts and career response in non-core districts served by composite staff.

Most apparent are the protracted times for the IBT to TD at the dispatch centre and firefighter turnout time. We recommend that Halifax Regional Fire & Emergency process map both these components to determine the cause of these apparent delays in reacting to emergencies.

Section 5 Change Implementation, Performance Measurement, and Standards

5.1 Background

As identified throughout this report, recommended changes to HRFE's service delivery criteria are based on several factors, including measuring performance against the 2006 service delivery standards (Section 4.2). However, we are concerned that the 2016–2017 data are not sufficiently accurate to be confident in the measurement results. One reason for this is the combined function of the IES.

Examining and explaining the issues and challenges of functioning within a combined police–fire communications centre is outside the scope of this assignment, but most observers would not understand the differences between police and fire call taking, or the dispatch handover process. This dual call taker role is made more complex in this case because staff also function as 9-1-1 call takers—so it is actually a triple call taking role. Each call taking and dispatch phase (please see Exhibit 2: NFPA Cascade of Events) is supposed to be marked with electronic time stamps initiated by call takers and dispatchers, but indications are that it is not unusual for these time stamps to be missed. No matter how conscientious call takers and dispatchers are, it is very difficult to change roles "on the fly" between being a 9-1-1 call taker, fire call taker, and police call taker, plus remember to capture all the time markers. Subsequently, many are missed.

Of all incidents handled by the Integrated Emergency Services, 90% are police related, and IES is operated by the police. It is therefore not unreasonable to expect that the majority of effort put into the administration and operation of the centre would be associated with police activities rather than fire, and that call takers would be more familiar, and have more experience, with police policies, procedures, and operations. Further, when budgetary decisions have to be prioritized, it is again reasonable to expect greater overall benefit would be achieved if decisions are made in favour of police rather than fire. Additionally, quality assurance and quality control functions, performed by IES supervisors, would be focused more on police activities simply due to the overwhelming volume of police versus fire incidents. Subsequently, the fire service finds itself in a position where it does not receive the attention it requires to ensure that accurate data contribute to increased efficiency.

Our experience, based on multiple projects at consolidated communications centres in Canada and the United States, is that combining unlike communication centres such as police, fire, and—in some cases—emergency medical services (EMS) is often unsuccessful because of the disparate nature of each of these emergency services. Amalgamating like dispatch centres (police with police, fire with fire, etc.) is reasonable and usually has a very quick payback period and continuing cost savings. That isn't the case when combining unlike centres, such as Halifax's, because of operational and administrative challenges.

Common misconceptions about communications centres and dispatching include

- police call taking and dispatching is the same as fire call taking and dispatching, and
- unlike dispatch centres can be successfully consolidated.

We recommend a separation of the police and fire call taking and dispatch functions. Ideally, the fire communications centre would be housed in a separate facility from the police dispatch, operated by the

fire service, and quality improvement would be a fire service responsibility. However, co-housing is possible assuming that the fire call taking and dispatch functions are overseen by HRFE.

It is highly likely that the police department and fire service can continue to share the existing computer aided dispatch system, even if located in separate facilities, with a firewall between the two functions for the purpose of maintaining police security. Although we expect that separating the police and fire call taking and dispatch functions, combined with robust analytics as recommended in Section 5.2.1, will result in increased fire service operational efficiencies, cost saving, and cost avoidance, we recommend that Halifax Regional Municipality and HRFE conduct an operational and technical cost–benefit analysis to determine the efficacy of this recommendation.

The following comments and recommendations are applicable whether or not there is continuation of an integrated police and fire communications centre.

5.2 Proposed Service Delivery Standards

This section addresses service delivery standards, proposed by Pomax, and guided by the following considerations:

1. Authority
2. Health and safety
3. Population density
4. The jurisdictional survey
5. Other reports and guidelines

1. Authority

We have confirmed that council has the latitude and authority as found in the *Halifax Regional Municipality Charter* to establish the service model it deems appropriate to the needs and circumstances of the community.

2. Health and Safety

The consultant team completed a thorough review of information related to the safe and effective provision of fire protection service, including

- the British Columbia Fire Services Playbook;
- Ontario Fire Marshal's Public Fire Safety Guidelines;
- firefighter occupational health and safety requirements in British Columbia, Ontario, and Nova Scotia;[9]
- the National Institute of Standards and Technology study to ascertain the effectiveness of fire crews of varying size (two-, three-, four-, and five-person crews) responding to a basic, 2,000-square-foot, two-story residential structure fire (please see Appendix G).

[9] We note that the Nova Scotia Ministry of Labour has issued an order for Halifax Regional Fire & Emergency to comply with the NFPA 1500 requirement to have four people on scene before entry can be made into a structure fire, except when it can be done safely to effect a critical rescue with fewer than four people on scene.

3. Population Density

Halifax Regional Municipality has a number of demographic and geographical characteristics that were considered in arriving at recommendations—for example,

- the variation of resident density in highly populated core areas;
- the remote location of many smaller communities, which have limited volunteer availability, long travel distances, and relatively low risk;
- the stations that serve large areas with varying population densities;
- the road network throughout station coverage areas; and
- the airport located in a rural area.

Population maps shown in Appendix E demonstrate the density and variances in the following order:

- By population dissemination block for the urban core (StatCan measurement)
- Population density per square mile for the urban core to reflect the application of the NFPA recommended standard
- Population density per square mile for the regional municipality

4. Jurisdictional Survey

Pomax conducted a survey of Canadian fire services in similar communities (Appendix A). One of the most important findings was that only one of the fire services that responded to the survey request indicated that it was able to meet the NFPA 1710 initial travel response guideline to structure fires of four firefighters in 4 minutes, 90% of the time, for the first responding vehicle. Other responses indicated 80% of the time was a more common accomplishment.

5. Other Reports or Observed Guidelines

We considered other reports and guidelines, such as

- appropriate sections of the NFPA Standard 1710, Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments, 2016 Edition;
- appropriate sections of the NFPA Standard 1720, Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Departments, 2014 Edition;
- a 2015 Fire Underwriters Survey that recommended continuous full-time staffing of station 45 based on risks associated with the Halifax Stanfield International Airport and the industrial/business park.

5.2.1 Discussion

In almost all discussions relating to fire protection, NFPA Standards 1710 and 1720 are considered. Appendix F: NFPA 1710 and 1720 Deployment Charts lays out incident descriptions, response criteria, and staffing levels within different scenarios. However, NFPA 1710 and 1720 are not statutory, and most municipalities regard them as targets. Those municipalities in Canada that do meet them would be exceptions. Appendix A: Comparative Jurisdictions Survey supports this conclusion.

Even though NFPA 1710 and 1720 address many aspects of fire safety and response, they are mostly discussed within the context of travel time—for example, in an initial response under 1710, a) the percentage within which 4 firefighters can arrive on scene inside 4 minutes' travel time, or b) 14 firefighters can arrive within 8 minutes. These standards are predicated on research, such as that completed by the National Institute of Standards and Technology, and fire propagation time (Appendix G and Figure 1: Fire Propagation Curve). In many cases, the discussion of fire stations, location, and staff numbers focuses on rapid response and suppression, but decision-makers need to take other considerations into account.

- Both NFPA 1710 and 1720 recommend response times specific to structure fires and the provision of EMS rather than all emergencies, whereas the 2006 Halifax standards encompass all emergency types.
  - With respect to medical emergencies, there is greater awareness that only a few percent are life threatening where minutes make a difference, and that even serious situations such as cardiac arrest are—in the first few minutes—as capably handled by public education and awareness, and wide availability of public access defibrillators, as emergency responders making the effort to assist at high speed.
- The 4-minute travel time identified in NFPA 1710 is based on the principle of getting an adequate number of firefighters (four) on scene in a time frame to contain a fire to the room of origin. But, in addition to travel time, the total response time includes
  - notification to the dispatch centre,
  - gathering information and alerting the responding fire crews, and
  - turnout time (please see Exhibit 2: NFPA Cascade of Events).
- Efficiency at each stage of the response increases the potential to achieve a successful outcome. However, there are many other factors that affect the outcome of an emergency fire response including
  - the stage of the fire when it was reported,
  - combustibility of the room contents,
  - initial scene assessment, and
  - implementation of the mitigation strategy.

Notwithstanding the bullet above that states that **efficiency at each stage of the response increases the potential to achieve a successful outcome**, the most effective and least costly strategy is not to have a fire at all. Even though we acknowledge that as a fanciful statement, and the absence of fires is likely not possible for many years to come, the incidence is decreasing across North America because of initiatives

such as improved public education, inspection, and targeting strategies; strengthened building standards and inspection; and installation of residential sprinkler systems where permitted.

Some fire services in North America are making increased use of analytics to determine how to achieve the greatest efficiency and effectiveness from available resources. Analytics have been an essential part of fire services in the United Kingdom and Scandinavia for almost 20 years, which has supported targeted public education and inspection, a dynamic deployment[10] of resources, robust risk analysis, and a significant reduction in costs. These fire services have a team of analysts that use almost-real-time software, such as Active Informatics and others, to drill down into every facet of incident origin and response to discover cause and effect, promote prevention, reduce resource requirements, and establish realistic standards based on accurate record keeping and risk analysis.

Even though the idea of a team of analysts sounds expensive, comparatively it is only a portion of staffing one active duty fire truck. Although calculated at a high level, Exhibit 15 demonstrates that the difference between implementing an analytics team compared to adding one fire crew 24 hours a day would be an offset of over $900,000 annually. This assumes that a team of analysts will be able to find efficiencies that will avoid the need to add fire resources. Proof of success can be found in many other jurisdictions that use such an approach, particularly the United Kingdom where there has been multi-decade pressure on municipalities to reduce costs yet maintain protection.

We recommend adding a four-person analytics team to Halifax Regional Fire & Emergency.

Exhibit 15: Analytics Team Implementation

Cost of adding one fire truck 24 hours	
Firefighter 3rd Class (2,190 hours annually)	**$58,822**
Hourly rate	$27
Annual Staffing hours – one fire truck	35,040
Firefighter availability (hours)	2,190
Number of firefighters required to staff one truck	16
Less: vacation	120
Less: illness, training, and other absences	100
Firefighter replacement	3,520
Firefighter hours required to staff one truck	38,560
Times hourly rate	$1,035,697
Benefits @22%	$227,853
Cost of adding one fire truck	$1,263,550

[10] Dynamic deployment means moving apparatus and staff to where they are needed depending on factors such as call load, time of day, population movement, and so forth, rather than assigning apparatus and staff to a fire station 24 hours a day. Fire departments have traditionally used a form of coverage referred to as “move-up” to protect areas where trucks and staff assigned to a station and area are occupied on incident response, but this is a very limited form of dynamic deployment.

Cost of adding four analysts	
Annual Analyst Salary (equivalent: firefighter 2nd class)	$71,427
Benefits @22%	$15,714
Total cost of one analyst	$87,141
Cost of four analysts	$348,564
Differential from adding one fire truck	($914,987)

The same analytical strategy proven to reduce costs and improve efficiency in other jurisdictions could be employed by Halifax Regional Fire & Emergency, although some changes would have to be made to the current data gathering strategy.

Although one of our recommendations in the Fire Dispatching Operational Review conducted in 2014/2015 was to continue with the current model of an integrated dispatch, we now recommend that HRFE establish its own dispatch centre in order to input reliable data upon which to base a response standard and tracking methodology. Unreliable or suspect data are not conducive to accurate analysis and improving efficiency. For example, we have had to base our findings and recommendations for this report on only two years of data, some of which are inaccurate.

A cost–benefit analysis of establishing a separate fire dispatching facility is not within the scope of this project, but a class D[11] estimate suggests cost recovery, as a result of operational efficiency due to establishing a fire dispatch centre and analytics section, would occur within three to five years, with ongoing savings after that date.

A robust analytics strategy of the type already established in other jurisdictions, constructed on accurate data, would enable Halifax to evaluate resource needs based on effectiveness and efficiency and quantify the following:[12]

Risk: A reference to the likelihood (frequency) of incidents and their potential outcome (injury and damage). Incidents that are more likely and can cause more injury or damage are high risk.

Risk assessment: The process of considering issues such as whether a risk level is high or low, the priority to be awarded to the risk, and whether the level of risk is tolerable or not; it involves a value-for-money assessment, as defined below.

Predominant risk: Those public safety incidents that pose a significant risk to life and property and on which to base resource planning.

Major incidents: Any emergency that requires the implementation of special arrangements by one or all of the emergency services, and will generally include the involvement, either directly or indirectly, of large numbers of people.

Locality: The area to which fire apparatus from a specific fire station are usually mobilized when incidents occur.

[11] An estimated "Order of Magnitude," strictly only an indication of the final cost; may vary by +/- 25%
[12] Adapted from the Public Entity Risk Institute (PERI)

Prevention and Education: The provision of information, publicity, and encouragement in respect of the steps to be taken to prevent fires and death or injury by fire, and the steps to be taken to detect fires and enable escape.

Response: The provision of emergency response resources for the purposes of extinguishing fire, protecting life and property, and rescue, including receiving emergency calls, mobilizing a response, and the equipment and firefighters required at an incident.

Resilience: The capacity of the fire service to sustain an acceptable level of function in the event of an emergency or other major event.

Value for money: The consideration of costs, making the most of money spent, and making sure that services meet the needs of communities and authorities' priorities.

Integrated risk management planning: The process of determining how prevention, protection, and response activities can be best used to mitigate the impact of risks on communities in a cost-effective way.

5.3 Preamble to Recommended Options

There are several options available to Halifax with respect to future fire services standards.

1. Take no action and allow the existing standards to continue.
2. Accept revised service delivery standards based on NFPA Standards but with an initial response time of 5 minutes in the urban core rather than 4 as stated in NFPA 1710.
3. Accept service delivery standards based on NFPA Standards, but amend the initial response time to 4 minutes in the urban core.
4. Choose a strategy based on improved analytics combined with clarification of Administrative Order Number 24 and the 2006 response standards.

The initiatives that best fit HRFE and the Halifax Regional Municipality are recommended below.

Performance Monitoring and Analysis

Adopt a response strategy based upon analytics to improve efficiency and effectiveness through targeted initiatives.

- Undertake a cost–benefit analysis to determine the feasibility of establishing a separate fire communications centre.
- Implement the use of analytics software, such as that used in the United Kingdom and Scandinavia for the past two decades, and adequate staffing to support the analytics effort.
- Accelerate the implementation of recommendations found within the 2014–2015 Fire Dispatching Operational Review report with respect to automated vehicle location software throughout the majority of HRFE's fleet to improve data capture and accuracy.

Alarm Handling (call taking and dispatch)

- The 2006 Standards indicates that dispatch time for all incidents will be 60 seconds.
- The NFPA 1221 standard states that 90% of alarm processing (similar in definition to Halifax's "dispatch time") shall be completed within 64 seconds, and 95% of alarm processing shall be completed within 106 seconds, except for some incidents such as medical, which shall be completed within 90 seconds, 90% of the time, and within 120 seconds, 99% of the time.
- In 2016, Integrated Emergency Services achieved the 90th percentile for structure fires in 145 seconds; in 2017, this was achieved in 111 seconds.

We recommend a target dispatch time of 90 seconds, 90% of the time, in the case of reported structure fires and special operations, which

- increases the 2006 Standards by 50% and brings it more in line with experienced performance and the NFPA standard,
- is similar to part of NFPA 1221 that states 95% of alarm processing shall be completed within 106 seconds,
- is applicable to reported structure fires and special operations rather than all incidents, and
- may be attainable with concerted effort by the communications centre.

Turnout

- The 2006 Standards indicates that turnout time for core stations, and rural stations when career staff are on duty, will be 60 seconds for all incident types.
- NFPA 1710-16, 4.1.2.1 states a turnout time of 80 seconds for fire and special operations response.
- In 2016, HRFE career firefighters achieved a 90th percentile turnout time for structure fires of 173 seconds; in 2017, this was 172 seconds.

We recommend a revised target turnout time for stations 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18, and composite stations when career firefighters are on duty, from the current 60 seconds to 90 seconds at the 90th percentile for fire responses, achieved over a three-year period.

i. In year one, target a 120-second benchmark;
ii. in year two, target a 105-second benchmark; and,
iii. in year three achieve a 90-second turnout time.

The NFPA turnout standard is based on ideal situations of apparatus access and firefighter readiness to respond. We recommend this phased-in approach based on the following considerations:

- Turnout is affected by
  - fire station design and travel routes to apparatus;
  - activities of the firefighters at the time of the alarm (training, maintenance responsibilities, location within or outside the fire station);

  - department policies regarding donning of bunker gear and procedures for firefighter safety (donning breathing apparatus, seat belts) prior to the initiation of travel time; and
  - firefighter understanding and acceptance of performing optimally in each phase of response to minimize total response times.
- Response to the comparative survey indicates that four of the consulted communities use a 90-second turnout time even though NFPA 1710 proposes an 80-second turnout time.

Additionally, a phased-in approach will provide opportunities for educating firefighters, measuring actual turnout times, and determining the practicalities of a final turnout time standard.

Turnout Rural Districts
Districts and stations 11, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 33, 34, 35, 36, 38, 39, 40, 41, 42, 43, 45, 47, 48, 50, 52, 54, 55, 56, 58, 60, 63, and 65.

- The 2006 Standards indicates that turnout time for volunteers in rural districts (population density under 100 persons per square kilometre) will be 6 minutes or less, 90% of the time.
- NFPA 1720-14 (volunteer fire departments) does not specify a turnout time, but table 4.3.2 of 1720-14 describes response time criteria and number of firefighters depending on population density. Response time, for areas with a population density of fewer than 1,000 people per square mile (2.6 square kilometres), is described as the time interval from the end of dispatch notification to arrival at the incident. This definition takes in both turnout time and response time.
- In 2016, volunteer firefighters achieved a 90th percentile turnout time of 462 seconds for all incidents; in 2017, this was 468 seconds.

We recommend continuing the existing turnout standard for volunteers in rural districts, even though volunteers have not been able to achieve the 2006 Standard. Based on the consultants' experience, it is a target that is common in other volunteer fire departments and should be strived for.

Response Time Core Fire Stations

- The 2006 Standards indicates that response time (travel time) for core stations will be 5 minutes or less, 90% of the time, for single unit responses or the first arriving vehicle of a multiple unit response. The 2006 Standards does not differentiate between fires and other incident types.
- NFPA 1710-16, 4.1.2.1 states a travel time of 240 seconds (4 minutes) for the first arriving engine company at a fire suppression or medical incident requiring an automatic external defibrillator.
- In 2016, career firefighters in the core districts achieved a 90th percentile travel time of 286 seconds for structure fires; in 2017, this was 289 seconds.
  - This performance is better than the 2006 Standards of 300 seconds' travel time.

We recommend continuing the initial response time target for urban core stations 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18 at 5 minutes for the first arriving apparatus.

- The comparable jurisdictions survey (Appendix A) indicates 240 seconds (4 minutes) is a common travel time target, but of those who reported on their ability to meet this standard, only one indicated a compliance of 95%, while others could achieve the 4-minute travel standard 80% of the time or less.
- Attempting to achieve compliance with NFPA 1710-16 (240 seconds for the first arriving engine company at a fire suppression or medical incident) is likely to require additional new fire stations and increased staffing in the urban area, as well as the closing and relocation of other fire stations to avoid response area overlaps and inefficiency after new stations are located.
- If consideration is given to capital and operational enhancements to try to attain a 240-second travel time, HRFE should first achieve a reliable data stream upon which to base any decisions.

Response Time Rural Districts

- The 2006 Standards indicates that response time (travel time) for rural stations will be 10 minutes or less, 90% of the time. The 2006 Standards does not differentiate between single or multiple unit response or between fires and other incident types.
- NFPA 1720-14 (volunteer fire departments) does not specify a turnout time, but table 4.3.2 of 1720-14 (please see Appendix F of this document) describes response time criteria and number of firefighters depending on population density. Response time, for areas with a population density of fewer than 1,000 people per square mile (2.6 square kilometres), is described as the time interval from the end of dispatch notification to arrival at the incident. This definition takes in both turnout time and response time.
    - Table 4.3.2 (NFPA 1720-14) lays out minimum staffing, response time, and percentage of time in which to meet the objective.
- In 2016, volunteer firefighters in the rural districts achieved a 90th percentile response (travel) time of 556 seconds for all incidents; in 2017, this was 549 seconds. This is better than the 2006 Standards target of 600 seconds, 90% of the time.
    - There was insufficient information for the consultants to measure the number of firefighters that responded to rural fire incidents.

We recommend that the standard for response by volunteer firefighters remain as stated in the 2006 Standards. Volunteers will continue to provide their best effort to protect their districts and adjacent districts.

- Although it is desirable to improve response standards, adopting those such as in 1720-14 will still be met with the practicalities of attracting and training enough volunteers, and their lack of availability during work hours or holiday periods.
- Where sufficient volunteers are available, Halifax should strive to improve response times and the number of volunteers responding to critical incidents.

Multiple Unit Responses Core Fire Stations

- The 2006 Standards indicates that response time (travel time) for subsequent arriving response units of a multiple unit response or alarm assignment will be 8 minutes, 90% of the time.
  - A full alarm assignment consists of 12 persons.
  - The 2006 Standards does not differentiate between fires and other incident types.
- NFPA 1710-16, 4.1.2.1 states a travel time of 480 seconds (8 minutes) for the deployment of an initial full alarm assignment at a fire suppression incident that is other than a high rise.
  - NFPA 5.2.4.1.1 describes the requirement for 14 firefighters at a full alarm assignment for a single-family dwelling fire incident (15 if an aerial device is used).
- In 2016, career firefighters in the core districts achieved a 90th percentile assembly of 12 firefighters at structure fires in 9 minutes and 30 seconds (570 seconds), and an 8-minute (480 second) assembly in 70% of incidents.
- In 2017, career firefighters in the core districts achieved a 90th percentile assembly of 12 firefighters at structure fires in 10 minutes and 15 seconds (615 seconds) and an 8-minute (480 second) assembly in 67% of incidents.
  - Although based on only two years of data, multiple unit response to the urban area has declined from 2016.

We recommend that HRFE should achieve, at minimum, the 2006 Standards of 12 firefighters in 8 minutes for multiple unit responses throughout the core area (station areas 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, and 18).

- We are aware that Halifax Regional Fire & Emergency has been undertaking a hiring process during 2018, but our understanding is that except for an enhancement of one person per shift at the 24-hour composite stations, and increased staffing for the aerial at station 13, the balance of hiring is for the purpose of offsetting overtime.
- We anticipate that the only way to achieve the 2006 Standards for multiple unit response is via new stations and new staff for those stations in order to reduce travel time. Adding stations may cause excessive response area overlap with existing stations, meaning that some existing stations may have to be relocated because of redundancy.
- Currently, multiple stations have to respond in order to assemble sufficient firefighters to fight a fire in a single-family dwelling, meaning that units from other stations must be moved toward the vacated stations to provide backup protection.
  - This is further compounded in the case of multi-unit dwellings, high-rises, and commercial establishments.
- Alternatively, increasing the staff levels at existing stations, where space permits, will improve the opportunity to assemble 12 to 14 firefighters within 8 minutes.
  - Increasing the number of firefighters at strategically located stations will also improve response and resource availability to fires in multi-unit dwellings, high-rises, and commercial establishments.

- We further anticipate that meeting the 2006 Standards for multiple unit response represents a multi-million-dollar capital investment for stations and apparatus, as well as continuing operational expenses for staff.
- Achieving the 2006 Standards for multiple unit responses is not likely to meet the NFPA Standard for a full alarm assignment, but HRFE will draw closer to that standard.

These recommendations underline the importance of accurate data for decision making and the importance of investing in analytical software and staff to ensure that decisions are made—and money spent—based on best available information.

We recommend that Halifax Regional Fire & Emergency continue its previous work of determining the most effective station locations with the objective of presenting station location and staffing options for achieving, at minimum, in the core area, the 2006 Standards of 12 firefighters in 8 minutes, and preferably 14 firefighters in 8 minutes—15 firefighters if an aerial apparatus is deployed.

5.4 Special Circumstances – the Airport Area

A February 2015 report by the FUS—which is a commercial product provided to Canadian insurance companies that subscribe to the service, but which also provides the benefit of resource consulting to municipalities—recommended that station 47 in the community of Goffs should be relocated and staffing increased. The basis for this recommendation is copied here from the FUS report:

Recommendations

- The level of risk in the Station 47 response area is high due to the presence of larger commercial buildings with higher Required Fire Flows in the Aerotech business park and the Halifax Stanfield International Airport. Furthermore, under the Transport Canada emergency response guideline the airport fire service is only responsible for crash rescue while the Municipal Fire Service is responsible for response to structure fires, and is funded through the Grant in lieu of taxes. To provide a level of response that is proportionate to the level of risk in this area, it is recommended that Station 47 be relocated to a more suitable location for response to Aerotech Business Park and the Airport. A new, adequately located fire station which is equipped with not less than an Aerial apparatus and Pumper with two four person, full-time crews would significantly improve the fire insurance grades for this area to the same level as the urban core of the HRM. Improving the Public Fire Protection Classification for Station 47 would ensure commercial property owners within the fire protection area receive the full benefit of available property insurance premium discounts based on the level of fire protection provided.

- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.

The FUS recommendation is to enhance resources from the current (2018) 15 volunteers to two 4-person career crews (8 firefighters 24 hours a day), an aerial apparatus, and a pumper.

Pomax finds it difficult to support this recommendation for several reasons, some of which were not apparent when the FUS report was written.

- In 2016, there were 60 incidents in station 47's area.
- In 2017, there were 51 incidents in station 47's area.
- In 2016, there were 185 incidents in the neighbouring area of station 45.
- In 2017, there were 187 incidents in the neighbouring area of station 45.
- Halifax Regional Fire & Emergency makes use of Quint apparatus, which provides the functions of a ladder or aerial truck, pumper, as well as carrying a water supply. Although a Quint ladder cannot reach the heights of an aerial platform, it will satisfy most requirements for fire suppression and rescue at a lower cost than an aerial.
- A mutual aid agreement with the community of Enfield, which has an aerial apparatus, provides backup capabilities as required.

Rather than support the recommendation made by FUS, which was drafted in a different operational environment, Pomax recommends that HRFE

- evaluate the staffing levels at station 45, including response to the airport area—for example, composite staffing of four career firefighters 24 hours a day at station 45, supported by an adequate cadre of volunteers, would provide fire suppression protection to the airport area, and those firefighters could also be active in promoting public education and prevention throughout the response area; and
- utilize apparatus such as a Quint rather than an aerial to service the Aerotech Business Park and airport area.

5.5 Call Taking and Dispatch

We recommend that Halifax Regional Fire & Emergency

- conduct a process mapping exercise of call taking and dispatch methods at the communications centre, and turnout activity at each fire station, to determine the practices and procedures that are impeding timelier dispatch and turnout; and
- provide council with an annual report indicating compliance, and areas of non-compliance, to whichever service delivery standard option council adopts.

We recommend that Halifax Regional Fire & Emergency and Integrated Emergency Services make an immediate concerted effort to collect the response data required to assess the practicality of, and compliance with, whichever service delivery targets are adopted.

- We have noted elsewhere in this report concerns regarding the accuracy of emergency response data required to confidently determine compliance with service delivery standards.
- Recommendations made in previous studies, with respect to improved record keeping, included a fire service liaison position located at the Integrated Emergency Services communications centre. Responsibilities would entail ensuring accurate, fire-service-specific data capture. That recommendation bears repeating because we are not aware that it has been implemented.
- Additionally, HRFE and IES should implement the following measures:

- Ensure accurate and consistent data recording and collection by developing or refining HRFE and IES data collection policies and procedures.
- Train all affected staff in data recording and collection policies and procedures.
- Implement an effective quality assurance process through monitoring, mentoring, and enforcing policies and procedures.

5.6 Implementation Recommendations

In order to achieve accurate incident data collection for ongoing monitoring of emergency response, we recommend that IES and HRFE

- work together at senior management levels to implement data entry standards, consistent data collection policies, and quality control management processes, as laid out in Appendix B of the 2015 Halifax Fire Dispatching Operational Review report, and review emergency response times on a quarterly basis to determine compliance with response standards and data quality; and
- provide an annual report to council detailing compliance with the approved service delivery standards.

We note that an earlier primary recommendation is the separation of the police and fire call taking dispatch function. The recommendations immediately above are valid until a separation occurs, and remain valid when HRFE operates its own call taking and dispatch function.

Implementing changes to service delivery will require oversight and senior staff leadership to ensure successful implementation of proposed service delivery standards.

Recommendation: Create a focused change management plan that includes

- using staff meetings, training sessions, and other opportunities for face-to-face discussions with fire department staff, volunteers, and the Integrated Emergency Services centre to share information, create understanding about new operating procedures, and build acceptance of the changes among those impacted;
- specific in-service training; and
- timely opportunities to receive feedback as changes are implemented.

A previously noted requirement of this review is to provide "a statistical baseline for ongoing performance measurement." Performance measurement is the process of collecting and analyzing historical information regarding emergency response to determine if approved service delivery standards are being met. If the historical data are unreliable, as is the case with Halifax, setting a baseline for ongoing measurement is subject to error, and the validity of performance results can be questioned.

Many of the aforementioned recommendations pertaining to data gathering, accuracy, technology implementation, and others will have to be accomplished in order to establish a statistical baseline for ongoing performance measurement. Nevertheless, we can be confident that there are few categories of response where HRFE is able to meet the 2006 Standards without implementation of the recommendations in this report.

Appendix A: Comparative Jurisdictions Survey

Fire Department Information Survey - August 2016

Municipality	Halifax, Nova Scotia	Ottawa, Ontario	Montreal, Quebec	Mississauga, Ontario	Windsor, Ontario	Calgary, Alberta	Richmond, British Columbia
Type of Fire Department	**Composite**	**Composite**	**Career**	**Career**	**Career**	**Career**	**Career**
Fire Department Coverage Area Types							
Rural	Yes	Yes	Yes				Yes
Suburban	Yes	Yes	Yes		Yes	Yes	Yes
Urban	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other (please specify)							significant agricultural
Population by coverage area							
Rural	92,133	11.3	5,000				4,200
Suburban	38,948	2.6	435,000		90,000		141,000
Urban	258,569	86.1	1,548,243	750,000	147,000		67,800
Total Population	**389,650**	**935,073**	**1,988,243**	**750,000**	**237,000**	**1,230,915**	**213,000**
Coverage areas of the fire department (sq. km.)							
Rural	2,587.7	90.4	50.0				32.2
Suburban	49.6	1.7	189.0		46.0		76.2
Urban	102.0	11.5	260.0	292.4	100.9		20.9
Total sq. km.	**2,739.4**	**2,790.0**	**499.0**	**292.4**	**146.9**	**848.0**	**129.3**
Fire department 2016 Budgets							
2016 Operating Budget Amount	58,305,000	$149,605,000	$350,992,600	$101,215,679	$4,388,976,700	$212,387,000	$33,000,000
2016 Capital Budget Amount		$15,668,000	$28,000,000	$2,500,000	$1,100,000,000	$34,043,000	$1,000,000
Percent of the operating budget allocated to compensation							
Percent of total budget	96%	89.50%	90%	97%	89.30%	94%	90%
Number of management and support staff							
Chief	1	1	1	1	2	1	1
Deputies	2	2	6	4	3	13	3
Administration	12	35	0	5	2	100	6
Training	12	12	0	11	2	18	4
Fire Prevention	14	34	0	38	2	41	8
Public Education	2	2	0	4	1	6	2
Mechanical	6	0	0	8	2	19	2
Total management and support staff	**49**	**86**	**7**	**71**	**14**	**198**	**26**
Number of fire stations							
Career	18	25	67	20	7	39	7
Volunteer/paid on call	24	16	0	0	0	0	0
Composite	9	4	0	0	0	0	0
Total number of fire stations	**51**	**45**	**67**	**20**	**7**	**39**	**7**
Number of full time suppression staff							
Platoon Chief		4	4	4	1	4	
Division/District Chief	12	20	52	12	8	21	4
Captain	82	116	520	30	35	174	48
Firefighters	315	729	1910	574	210	1080	149
Total full time suppression staff	**409**	**869**	**2486**	**620**	**254**	**1279**	**201**
Number of volunteer/paid on call staff							
Division/District Chiefs	5	4					

Municipality	Halifax, Nova Scotia	Ottawa, Ontario	Montreal, Quebec	Mississauga, Ontario	Windsor, Ontario	Calgary, Alberta	Richmond, British Columbia
Station Chiefs/Captains	29	16					
Lieutenants	69	64					
Firefighters	528	433					
Total volunteer/paid on call staff	**631**	**517**					
Minimum staffing policy for the following:							
Pumpers	4	4	4	4	4	4	4
Aerials (no pump)	0	0	3	0	0	2	4
Aerials (with pump)	2	3	0	3	4	0	4
Quints	4	0	0	4	5	4	4
Rescue Units	4	3	4	3	0	2	2
Tanker	4	4	1	0	0	2	0
Command Unit	0	0	3	1	2	0	0
Marine Firefighting Units	0	0	0	0	0	2	0
Tactical Units	2	0	0	0	0	0	0
Service delivery standard for initial response to structure fires for full/time career stations							
Pumper - Number of Vehicles		3	2	2	1	2	2
Pumper - Minimum Number of Responders	4	3	8	8	4	8	8
Aerial - Number of Vehicles		1	2	2	1	1	0
Aerial - Minimum Number of Responders	2	3	6	6	4	2	0
Rescue - Number of Vehicles		0	1	1	0	1	1
Rescue - Minimum Number of Responders	4	0	4	3	0	2	2
Command - Number of Vehicles		1	1	1	1	1	1
Command - Minimum Number of Responders		1	1	1	2	1	1
Quint - Number of Vehicles		0	0	0	0	0	1
Quint - Minimum Number of Responders	4	0	0	0	0	0	4
Tactical Unit - Number of Vehicles		0	0	0	0	0	0
Tactical Unit - Minimum Number of Responders	2	0	0	0	0	0	0
Service delivery standard for initial response units to structure fires for volunteer/paid on call stations							
Pumper - Number of Vehicles		3					
Pumper - Minimum number of Responders	4						
Aerial - Number of Vehicles		1					
Aerial - Minimum number of Responders							
Quint - Number of Vehicles							
Quint - Minimum number of Responders							
Tanker - Number of Vehicles		3					
Tanker - Minimum number of Responders							
Command Unit - Number of Vehicles		1					
Command Unit - Minimum number of Responders							
Other		15 - total on scene					

Municipality	Halifax, Nova Scotia	Ottawa, Ontario	Montreal, Quebec	Mississauga, Ontario	Windsor, Ontario	Calgary, Alberta	Richmond, British Columbia
Service delivery standard for deployment to structure fires for full time/career stations							
Dispatch Time	60	60	60	60	75	30	60
Turnout Time	60	90	80	90	90	90	80
Travel Time	300	Urban 240 Suburban 300 Rural 600	240	240	240	270	240
Initiating Action/Intervention Time			380	not tracked			480
Service delivery standard for deployment to structure for volunteer/paid on call stations							
Turnout Time	300	300					
Travel Time	600	Urban 240, Suburban 300, Rural 600					
Number of Responders	4	18					
Initiating Action/Intervention Time							
For full time stations - percentage of service delivery standards are achieved for each benchmark?							
Dispatch Time				90%		80.4%	95%
Turnout Time				90%		60.2%	65%
Travel Time				67%	95%	77.1%	80%
Service delivery standards based on the following:							
Population Density	Yes	Yes		Yes	Yes		Yes
Risk Assessment	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Standards such as NFPA	Yes	Yes	Yes	Yes		Yes	Yes
Service delivery standards approved by municipal council							
Standards are approved by council (yes/no)	Yes	Yes	Yes	Yes	Yes	Yes	No
Trigger points at which a volunteer/paid on call fire station would be converted to a full time/career station?	Yes						
Trigger points to convert a volunteer/paid on call fire station to a full time/career station?	increase in population density	Growth, Construction, Response Level, Risk, Land Use	No	no	No	Skipped	No
Specialty services, and level of service provided (awareness/operational/technical)			Skipped	Skipped			Skipped
Emergency Medical Response - Service Level	Technical	Operational			Operational	Technical	
Vehicle Rescue - Service Level	Technical	Technical			Technical	Technical	
Heavy Equipment/Machinery Rescue - Service Level	Technical	Technical			Awareness	Technical	
Water Rescue - Service Level	Technical	Technical			Awareness	Technical	
Confined space - Service Level	Technical	Technical			Awareness	Technical	
Trench Rescue - Service Level	Technical	Technical			Awareness	Technical	
High Angle Rescue - Service Level	Technical	Technical			Awareness	Technical	

Appendix B: Administrative Order Number 24

HALIFAX REGIONAL MUNICIPALITY
ADMINISTRATIVE ORDER NUMBER 24
RESPECTING FIRE AND EMERGENCY SERVICE
IN HALIFAX REGIONAL MUNICIPALITY

BE IT RESOLVED as a policy of the Council of the Halifax Regional Municipality pursuant to the *Municipal Government Act* as follows:

SHORT TITLE

1. The Administrative Order may be cited as Administrative Order Number 24 the Halifax Regional Municipality Fire and Emergency Service Administrative Order.

DEFINITIONS

2. In this Administrative Order,

(a) "Council" means the Halifax Regional Council;

(b) "Fire Service" means Halifax Regional Fire and Emergency Service;

(c) "Halifax Regional Fire and Emergency Service" means collectively the full-time, composite and volunteer fire services within the Halifax Regional Municipality with the exception of a volunteer department that has registered independently as a fire department and/or emergency service provider pursuant to Part II of this Administrative Order.

(d) "Member" means a firefighter employed by the Fire Service or a volunteer firefighter who is a member of a volunteer fire department that is part of the Fire Service.

PART I
HALIFAX REGIONAL FIRE AND EMERGENCY SERVICE

DEPARTMENT

3. (1) The Halifax Regional Fire and Emergency Service is hereby registered as a fire department pursuant to Section 294 of the *Municipal Government Act*.

(2) The Fire Service shall endeavour to provide the emergency services designated in Appendix "A" in the whole of Halifax Regional Municipality with the exception of those areas serviced by a volunteer fire department registered pursuant to Part II of this Administrative

Order.

CHIEF OFFICER

4. (1) The Chief Director of Fire and Emergency Services of the Halifax Regional Municipality shall be the Chief Officer of the Fire Service.

(2) The Chief Officer shall administer the day to day business affairs of the Fire Service in accordance with the policies, plans and budgets approved by the Council and as the senior fire services manager within HRM, advise the Chief Administrative Officer or his delegate with respect to the provision of efficient, effective and economical municipal fire services within Halifax Regional Municipality.

(3) The Chief Officer shall have under his/her direction and control all members constituting the Fire Service and he/she shall be responsible for keeping discipline in the Fire Service.

(4) The Chief Officer may appoint a Deputy Chief Officer(s) who shall assist the Chief Officer in the discharge of his/her duties and for such purposes he/she shall have like powers as the Chief Officer, provided that at all times the Deputy Chief Officer(s) shall be subject to the lawful direction of the Chief Officer.

(5) The Deputy Chief Officer(s) shall, in the case of the Chief Officer's absence from the municipality, vacation, illness or other incapacity, or during a vacancy in the office of the Chief Officer, have all of the powers and privileges of the Chief Officer and perform all of the duties of the Chief Officer.

(6) The Chief Officer may delegate such powers and responsibilities as he/she sees fit.

(7) The Chief Officer may enter into an agreement to provide fire and emergency services to, or obtain such services from another municipality or registered fire department. Services provided to Halifax Regional Municipality under such circumstances shall be defined by contract and/or mutual aid agreement outlining the type and level of services.

QUALIFICATIONS

5 (1) No person shall be eligible for entry in the Fire Service either on a full time, part time or voluntary basis unless the person meets the criteria as developed by the Halifax Regional Fire and Emergency Service.

(2) The Chief Officer may appoint to the Fire Service any person qualified under subsection (1) when a vacancy occurs through the death, retirement, resignation or discharge of a member with the result that the complement of the Fire Service is below the staff complement approved by Council or where the Council increases the staff complement of the

Fire Service.

(3) Any firefighter hired by the Fire Service shall be employed for a probation period of one year during which time the Chief Officer may summarily dismiss any such firefighter if, in the opinion of the Chief Officer, such firefighter is unsuitable to continue to be a member of the Fire Service.

PROMOTIONS

6 (1) The Chief Officer may summarily reduce the rank of any member of the Fire Service within one year from the date of the appointment of such member to any rank, if, in the opinion of the Chief Officer, such member is incapable of properly performing or has failed to perform properly the duties pertaining to such rank or is otherwise unsuitable to hold such rank.

(2) The Chief Officer may summarily extend the probation period of a member in a rank for up to one additional year if the Chief Officer has reservations about the performance of such member in that rank.

(3) Nothing in this Section is intended to amend the provisions of any collective agreement in place from time to time in respect of the employment of any members of the Fire Service and this Section shall be interpreted to be consistent with the provisions of such collective agreements as may be in place from time to time.

DISCIPLINE

7 (1) Without restricting the generality of Section 4, the Chief Officer shall have the power to hire, discharge, transfer, promote, demote, suspend and otherwise discipline any member of the Fire Service.

(2) In exercising his/her jurisdiction pursuant to subsection (1), the Chief Officer shall comply with any applicable provisions of any collective agreement in force and effect from time to time.

(3) The Chief Officer may delegate any of the powers pursuant to subsection (1) to officers of the Fire Service.

PART II
REGISTRATION OF FIRE DEPARTMENT

APPLICATION FOR REGISTRATION

8 (1) If a volunteer fire department desires to be registered as a fire department and/or emergency service provider independent of the Fire Service, the volunteer department shall submit to the Chief Officer of the Fire Service a written application in form attached as

Appendix “B” to this Administrative Order.

(2) The application shall be accompanied by:

(a) A copy of a current certificate of incorporation of the applicant;

(b) Proof of public liability insurance in an amount not less than $20,000,000.00 with a deductible that is 10% of the departments operating budget to a maximum of $5,000 for each occurrence, including the Halifax Regional Municipality as an additional named insured with a cross liability clause;

(c) Proof that the department has insurance that meets or exceeds the level of volunteer insurance currently provided by the Municipality for death, injury and accident;

(d) A statement to the effect that the applicant does not provide the service for a profit;

(e) Information sufficient to demonstrate that the applicant can meet the service standards set out in this Administrative Order;

(f) A Resolution passed by a majority of the members of the applicant, in a vote conducted by secret ballot conducted by the Municipal Clerk, at a General Meeting of the applicant duly called for that purpose indicating that the membership supports the applicant being registered as a fire department and/or emergency service provider independent of the Fire Service.

(3) On receipt of the application for registration, the Chief Officer shall inform Regional Council of the application, whereupon

(i) the Regional Council shall direct the Municipal Clerk to conduct a plebiscite in the community proposed to be served by the applicant at which the community shall be asked whether they are in favour of the applicant being registered as a fire department and/or emergency service provider independent of the Fire Service, and that the community is prepared to directly undertake the financial support of the applicant’s operations and to report the results to the Regional Council ; and

(ii) the Chief Officer shall cause the application to be reviewed and assessed against the provisions of the *Municipal Government Act* and this Administrative Order and shall report to Regional Council with a

recommendation as to whether the applicant shall be registered as a fire department.

(4) If the Regional Council is satisfied that the applicant meets the provisions of the *Municipal Government Act* and this Administrative Order, it shall register the applicant as a fire department.

(5) A fire department registered pursuant to this Administrative Order shall

(a) meet the National Fire Protection Association 1500 for Firefighter Occupational Health and Safety or other standards as adopted by the Fire Service including standards for apparatus, equipment and buildings as well as the provisions of the Occupational Health and Safety Act of the Province of Nova Scotia, where applicable;

(b) submit timely and accurate reports regarding but not limited to training, incidents, fire prevention; and

where the Halifax Regional Municipality provides funding to the department,

(c) comply with the policies of the Halifax Regional Municipality with respect to recruitment and hiring; and

(d) follow all Halifax Regional Municipality policies relevant to finance and procurement practices, as well as the Halifax Regional Municipality's budgeting, reporting and auditing practices and guidelines as applicable from time to time.

(6) A fire department registered pursuant to this Administrative Order shall report to the Council, at least quarterly regarding the complete operation of the department and shall provide audited statements of all expenditures made and income received and of the financial position of the department and the Municipality may withhold funding to the department if the reports and statements are not submitted in a timely manner.

(7) A fire department registered pursuant to this Administrative Order shall hold an annual meeting open to the public in the community served by the department to report to and receive feedback from the community respecting fire and emergency services within the community.

(8) A fire department registered pursuant to this Administrative Order may enter into mutual aid agreement(s) for services that may be required to/from other Halifax Regional Municipality fire departments. A copy of such agreement(s) shall be submitted to the Chief Officer of the Fire Service.

APPENDIX A

The Regional Fire Service shall endeavour to provide emergency services in the Halifax Regional Municipality formerly made up of the City of Halifax, City of Dartmouth, Town of Bedford and the County of Halifax at the service levels indicated below unless otherwise indicated by registration or policy;

Fire and Related Emergencies:	Structural and Wildland
Medical Response:	1st Responder
Vehicle Rescue:	Operational
Water Rescue:	Operational
Ice Rescue:	Operational
Structural/Confined Space Rescue:	Operational
High Angle Rescue:	Operational
Hazardous Materials:	Operational
Search and Rescue:	Assistance
Fire Prevention and Education:	Inspections, Investigations, Public Education

APPENDIX B

Department making application:_____

Contact person:_____

Contact mailing address:_____

Contact phone numbers(s):_____

Communities or area protected:_____

Service area boundaries will be established by the Municipality based on accepted fire service practices.

Please indicate the service(s) the department will provide
and the level of that service by placing a **U** in the appropriate circle.

1. Fire & Related Emergencies:			
Structural •	Defensive •	Wildland •	N/A •
2. Medical Response:			
	Registered 1st Responder •	Medical Assistance •	N/A •
3. Vehicle Rescue:			
Technician •	Operational •	Awareness •	N/A •
4. Water Rescue:			
Technician •	Operational •	Awareness •	N/A •
5. Ice Rescue:			
Technician •	Operational •	Awareness •	N/A •

6. Structural/ Confined Space Rescue:			
Technician •	Operational •	Awareness •	N/A •
7. High Angle Rescue:			
Technician •	Operational •	Awareness •	N/A •
8. Hazardous Materials:			
Technician •	Operational •	Awareness •	N/A •
9. Ground Search & Rescue:			
	Provider •	Assistance •	N/A •
10. Fire Prevention & Public Education:			
Residential Inspections •	Commercial Inspections •	Fire Investigations •	Public Education •
11. Other services:		**Level of service:**	

For an explanation of the terms listed above, please refer to the "Definition of Terms" attached as Appendix "C".

12. Are there limits on the level of service that will be provided in respect to any of the services identified above? If so, please indicate:

13. Does the department have the appropriate, approved equipment and apparatus to safely perform the services identified above? If not, please explain:

14. Does the department have the appropriate training and experience necessary to safely perform the services identified above? Please explain:

Date: _____ Date: _____

_____ _____

Signature of Department Representative

Signature of HRM Chief Officer

Note: An explanation of the terminology used in this registration form is attached as Appendix "C". To register, a department must be incorporated and provide proof of all the valid liability insurances required by the municipality. Registration does not make the department an agent of the municipality and the department must operate on a not-for-profit basis. The department agrees to provide the municipality with the necessary reports in the time prescribed by the municipality and to fulfill it's responsibilities as identified.

All assets purchased with public funds shall remain the property of the Halifax Regional Municipality and shall be maintained in accordance with Fire Service

Policies, applicable standards and legislation.

Failure of the Fire Department to meet the requirements identified shall cause the Fire Service to revoke the registration.

APPENDIX C

DEFINITION OF TERMS USED IN THE REGISTRATION FORM

1. Fire and Fire Related Emergencies:

Structural: Means the activities of rescue, fire suppression, and property conservation in buildings, enclosed structures, vehicles, vessels, or like properties that are involved in a fire or emergency situation. Departments should have firefighters trained to NFPA Standard 1001 (latest approved edition), protective personal equipment, down alarms, accountability system, adequate water supply, pumping capacity and an incident command system. Departments should also have the proper training and protective clothing for wildland fires in accordance with the Department of Natural Resources' provincial standard. Shipboard firefighting, if provided, should be carried out following the NFPA Standard 1405, latest approved edition, *Guide for Land-Based Fire Fighters who Respond to Marine Vessel Fires*. Protection of aircraft at airports by volunteers, if provided, should be in accordance with Transport Canada guidelines.

Defensive: Means actions that are intended to control a fire by limiting its spread to a defined area, avoiding the commitment of personnel and equipment to dangerous areas. Defensive operations are generally performed from the exterior of structures and are based on a determination that the risk to personnel exceeds the potential benefits of offensive actions. Fire departments without the ability to carry out structural firefighting may register as providing property protection through defensive strategies. Rescue may be undertaken if the benefit warrants the risk. Departments should have proper training and protective clothing for wildland fires in accordance with the Department of Natural Resources' provincial standard.

N/A: Means the department does not respond to these calls.

2. Medical Emergencies: Response to known medical emergencies.

Registered First Responder: Means responders registered with the Department of Health through the EHS first responder program and respond to medical calls or provide medical assistance at the scene of a n incident.

Medical Assistance: Means responders who have standard or emergency first aid and respond to medical emergencies or provide medical assistance at a response incident. Equipment includes a first aid kit.

3. to 7. Vehicle Rescue, Water Rescue, Ice Rescue, Structural/Excavation Collapse

and High Angle Rescue: These activities should be carried out in accordance with NFPA Standard 1670, latest approved edition, *Operations and Training for Technical Rescue Incidents.*

Generally the terms are:

Technician: First responders at the technician level are those personal who respond, as either initial call-out or as a mutual aid response to contain and control the incident. This level of service usually will provide a high degree of intervention.

Operations: First responders at the operations level are those persons who respond as the initial response to an incident for the purpose of protecting nearby persons, the environment, or property from the effects of the incident. First responders at the operations level are expected to respond in a defensive fashion to control, prevent a worsening of the incident and provide services within their capabilities.

Awareness: First responders at the awareness level are those persons who, in the course of their normal duties, could be the first on the scene of an emergency. First responders at the awareness level are expected to recognize the situation, call for trained personnel, secure the area and provide minimum intervention.

Refer to NFPA Standard 1670, but, for example, these terms mean:

3. Vehicle Rescue: Means removal of victims from a vehicle following an accident. This may require elaborate or simple tools and knowledge depending upon the incident. The first responder should be aware of the department's abilities and when it is necessary to request a higher level of service.

Technician: Properly maintained complete set of heavy hydraulic extrication equipment and associated spreaders, cutters, rams, chains, cribbing, etc and trained as a team to use the equipment, recognize hazards and protect the victim(s).

Operations: Properly maintained hand tools, manual hydraulic tools, air tools and trained as a team to use the equipment, recognize hazards and protect the victim(s).

Awareness: does not have the equipment for extrication but does respond to motor vehicle accidents.

4. Water Rescue: Means rescue of individuals from rivers, lakes, ponds, and may include body retrieval.

Technician: Survival suits, water rescue kit, if diving is provided;; appropriate equipment for conditions, a boat including life jackets. Training to a level for the service provided, either surface rescue or diving. Ropes and other similar equipment should meet NFPA Standard 1983, latest approved edition, *Fire Service Life Safety Rope and System Components*.

Operations: Approved life jackets for each rescuer, throw ropes, life ring with rope, a boat. Training should include boating safety. Ropes and other similar equipment should meet NFPA Standard 1983, latest approved edition, *Fire Service Life Safety Rope and System Components*.

Awareness: Responds but does not have the equipment or training.

5. Ice Rescue: Rescue of individuals from extremely cold water or ice.

Technician: Full ice rescue kit including floatation suit and ice board or equivalent. Training for cold water rescue. Ropes and other similar equipment should meet NFPA Standard 1983, latest approved edition, *Fire Service Life Safety Rope and System Components*.

Operations: Approved life jackets for each rescuer, throw ropes, life ring with rope. Trained respecting safety of rescuer and victim. Ropes and other similar equipment should meet NFPA Standard 1983, latest approved edition, *Fire Service Life Safety Rope and System Components*.

6. Structural/Excavation Collapse: Rescue of persons from collapsed ditches, etc or collapsed structures. There are five levels of service– each department should examine the document to determine their own level of ability.

Technician: Providing this service should meet the full requirements of NFPA 1670 (latest approved edition).

Operations: Provides a medium level of service in accordance with NFPA 1670 (latest approved edition).

Awareness: Assists visible victims, prevents further collapse.

7. High Angle Rescue: Rescue of persons from building faces, cliffs, trees or other locations where individuals must be lowered or raised by the rescuer.

Technician: Equipment recommended by and training provided by a recognized

high angle rescue organization.

Operations: Ropes and other similar equipment should meet NFPA 1983 (latest approved edition) and firefighters should be equipped with the gloves and protective clothing required for the particular incident. Training on knot tying.

Awareness: Secures the scene, stabilizes the incident.

8. Hazardous Materials: Response to chemical incidents. All levels should be in accordance with NFPA Standard 472, latest approved edition, *Professional Competence of Responders to Hazardous Materials Incidents*. Fuel spills such as oil, gas and diesel may be handled by all three levels if the spill is minor and stabilized. There is a wide range of service, from a domestic oil spill to an upset gasoline tanker. The important factor is that the department knows its limitations.

Technician: Hazardous materials technicians are those persons who respond to releases or potential releases of hazardous materials for the purpose of controlling the release. Hazardous materials technicians are expected to use specialized chemical protective clothing and specialized control equipment.

Operations: First responders at the operations level are expected to respond in a defensive fashion to control the release from a safe distance and keep it from spreading.

Awareness: First responders at the awareness level are those persons who, in the course of their normal duties, could be the first on the scene of an emergency involving hazardous materials. First responders at the awareness level are expected to recognize the presence of hazardous materials, protect themselves, call for trained personnel and secure the area.

9. Ground Search and Rescue:

Provider: Meets the Nova Scotia Emergency Measures Organizations's provincial standard for SAR teams.

Assistance: Members are under the control of a SAR team.

Done and passed in Council this 12th day of June, 2001

_____

MAYOR

_____

MUNICIPAL CLERK

I, Vi Carmichael, Municipal Clerk of Halifax Regional Municipality, hereby certify that the above-noted Administrative Order was passed at a meeting of Halifax Regional Council held on June 12, 2001.

_____

Vi Carmichael, Municipal Clerk

Administrative Order Number 24

Notive of Motion: April 3, 2001
Approved: June 12, 2001

Appendix C: HRFE Dispatch Review Recommendations

The following summarizes recommendations resulting from a review of the Fire Dispatching Operational Review completed in 2015 by Pomax.

#	Recommendations (Fire Dispatching Operational Review, March 2015)	Priority and Implementation
	Service Delivery Standards The Steering Committee direct the Operational Working Group to develop draft service delivery standards relevant to the call taking and dispatch system for approval by the Steering Committee and adoption by Halifax Regional Council.	Immediate Priority with development in the 1st and 2nd fiscal quarters of 2015/16 and approval by Council in the 3rd fiscal quarter of 2015/16.
	The following technical modifications and policy change be implemented to ensure accurate data collection, recording, and retrieval of the time of the original 9-1-1 call in order to provide a total response time measurement. The detailed analysis of this recommendation and options for resolution are provided in the "Options Report" Sections 2.5 and 3.2.9. Technological Modifications: • Develop an interface to export the 9-1-1 initial call answer time to the FDM records management system using the new interface between Versaterm CAD and FDM Records Management System (RDM) that was developed for Ottawa Fire Services (which uses the same CAD and RMS systems). This interface will also import additional data that can be accessed via the FDM RMS. • As 9-1-1 calls can be received at other provincial 9-1-1 call centres and transferred to Integrated Emergency Services, we recommend that during the design of the Versaterm interface between the Provincial 9-1-1 system and the Integrated Emergency Services Fire Dispatch CAD, programming logic should be included to determine if the call was received directly from the Provincial 9-1-1 system or from a Transfer, and the time of receipt at both the call centre originally receiving the call and the time of the transfer to Integrated Emergency Services should be captured. • Re-program the Nova Scotia 9-1-1 telephone system F6 data transfer function to populate the Versaterm call entry screen with a Call Answer date/time stamp and telephone number only. • Develop and implement a policy and procedure that requires call takers to execute the F6 function to populate the CAD from the 9-1-1 screen at the start of every 9-1-1 fire dispatch incident.	Immediate Priority with implementation in the 1st fiscal quarter of 2015/16.

#	Recommendations (Fire Dispatching Operational Review, March 2015)	Priority and Implementation
	Automatic Additional Alarm Assignments • Integrated Emergency Services and Halifax Regional Fire & Emergency review alarm assignments and implement changes in the CAD to reflect how assignments are displayed, in particular that multiple alarms are defined instead of the current practice of requesting additional vehicles by apparatus type. • Policy is changed to define what unit types will be assigned in multiple alarms, and they be defined by geographic zone as secondary and tertiary responses that may differ conditional on available apparatus types and whether the staffing is career, composite, or volunteer firefighters. Once the alarms are defined, the CAD system can be configured to accommodate the alarm types.	Immediate Priority with implementation in 2nd fiscal quarter of 2015/16.
	Move Up of Apparatus for Optimum Response Coverage HRFE work with Versaterm to review existing system options and the best way to configure move-ups in the CAD system, and the associated policy and procedure be developed by Halifax Regional Fire & Emergency.	Immediate Priority with implementation in the 2nd fiscal quarter of 2015/16.
	Dispatch Policies and Procedures The Integrated Emergency Services Steering Committee direct the Operations Working Group to undertake a comprehensive review and revision of all policies and procedures that impact the dispatching process and establish a methodology for regular review of these policies and procedures.	Immediate Priority with review policies in the 1st and 2nd fiscal quarters of 2015/16, and finalized policies and procedures provided to the Steering Committee for approval in the 3rd fiscal quarter of 2015/16.
	Firefighter Notification • Implement the suggested Business Practice Initiatives within 8 weeks of accepting this report. • Implement printed alarm notifications at an estimated cost of up to $5,580. There will be internal costs to the municipality for procurement, installation, and maintenance. This is a relatively straightforward, low-cost solution to reduce fire station delays; can take place during the 1st and 2nd fiscal quarters of 2015/16; and will save about 10 seconds per incident. • Do not replace fire station speakers pending an assessment of the success of revised business practice initiatives and printed alarm notification. • Do not add paging transmitters.	Priority and implementation timelines are noted within the recommendations.

#	Recommendations (Fire Dispatching Operational Review, March 2015)	Priority and Implementation
	• Implement automated alerting at an approximate cost of less than $1,000,000. Preparation of a Request for Proposal can take place in the second fiscal quarter of 2015/2016, and assuming funding is approved, purchase and implementation should be complete by the third fiscal quarter of 2016/2017. • Reassess the circumstances during which dedicated fire dispatchers are required and whether staff can serve the function of combined fire dispatchers. This assessment could start in the first fiscal quarter of 2015/2016 and may result in the recovery of resources valued at up to $394,800 annually as technical recommendations are implemented.	
	Alarm Receipt Confirmation Halifax Regional Municipality implements the use of the IamResponding program, develops a policy and procedure for approval by the Integrated Emergency Services and Halifax Regional Fire & Emergency, and institutes adequate training.	Immediate Priority purchase in the 2nd and 3rd fiscal quarters of 2015/16, implementation in the 4th fiscal quarter of 2015/16.
	Senior Management Automated Notification Halifax Regional Fire & Emergency pilot the use of the vMobile Application from Versaterm as an alerting method for senior management. VMobile is a reduced subset of the full MDT software, but designed for use on smartphones (supported models of Blackberry, Android, iOS, Windows).	Immediate Priority with purchase and implementation in the 2nd and 3rd fiscal quarters of 2015/16.
	Mobile Computing Halifax Regional Municipality acquire and activate 44 mobile computers for the core area apparatus, duty commander units, and E Platoon career apparatus, and equip 10 spare apparatus with mounting equipment and antennas (allowing the portable devices to be relocated to the spare apparatus when these vehicles are put into service). Another 76 fire vehicles used in rural areas are not recommended for the installation of mobile computers or mounting equipment.	Long-Term Priority conduct equipment research and testing in the 3rd fiscal quarter of 2016/17, tender process to take place in the 4th fiscal quarter of 2016/17 and 1st fiscal quarters of 2017/18, and acquisition, training, and full implementation in the 2nd and 3rd fiscal quarters of 2017/18.
	Automatic Vehicle Location (AVL) AVL be implemented using the Versaterm system for the 54 vehicles identified for mobile computing, including the 10 spare apparatus; as well, we recommend a Versaterm interface with the 3rd-party corporate AVL application for the 76 HRFE vehicles that will not be equipped with mobile computers.	Long-Term Priority for implementation with the Mobile Data Terminals in the 2nd and 3rd fiscal quarters of 2017/18.
	Nova Scotia EMS – Versaterm Link Halifax Regional Municipality purchase and implement the CAD-to-CAD link between the Versaterm Police/Fire CAD and the EMS CAD provided by TriTech.	Short-Term Priority for implementation in the 2nd fiscal quarter of 2015/16.

#	Recommendations (Fire Dispatching Operational Review, March 2015)	Priority and Implementation
	Integrated Emergency Services Staffing and Training • Integrated Emergency Services continue with the current 9-1-1 call taking training, certification, and evaluation programs as developed, implemented, and managed by the Nova Scotia Emergency Management Office, and that the fire dispatcher training program should be reviewed and evaluated to ensure it meets the requirements of NFPA 1061: Standard for Professional Qualifications for Public Safety Telecommunications Personnel. • Integrated Emergency Services consider undertaking a call taking and dispatching process mapping exercise, including "time and motion" studies, to determine if reasonable efficiencies can be found to offset backfill and other staffing pressures that are being met by Supervisors, or to complement technology initiatives.	Immediate Priority with review of fire dispatching training in 2nd and 3rd fiscal quarters of 2015/16 and commencement of revised training program in 4th fiscal quarter of 2015/16.
	Quality Management Program • Integrated Emergency Services implement a Quality Assurance and Improvement Program for fire dispatch services. • A staff position be established and filled by a person with the formal education and demonstrated skills and aptitude commensurate with fulfilling the scope requirements, and that position be assigned responsibility for implementation and ongoing management of the Quality Management Program. If our recommendation for implementing police–fire dispatcher roles rather than the current dedicated fire dispatch seats is accepted, the QA/QI position should be able to serve both police and fire call taking and dispatch roles.	Immediate Priority as follows: Quality Assurance program position and responsibility should be identified in the 2nd fiscal quarter of 2015/16 Service Delivery Standards be completed, and approved by the Steering Committee in the 3rd fiscal quarter of 2015/16 (please see **Recommendation #1)**. Service Delivery Standards adopted by Council and implemented in the 4th fiscal quarter of 2015/16.
	Information Communication and Technology Support Establish a new position, or reassigning an existing FTE to a position that provides the knowledge and skill to effectively apply the fire dispatch operational needs and priorities to the functionality of the Versaterm CAD. This position would be filled by an individual with an interest in CAD capabilities who is afforded the time, administrative privileges, and the opportunity to attend appropriate CAD knowledge and development courses. The position responsibility would include discovering the capabilities of the CAD and supporting improved dispatch related efficiency and effectiveness at Integrated Emergency Services and HRFE. Although the complement position may be employed by another department, the position should be located within Integrated Emergency Services, so that the individual has daily access and exposure to the CAD.	Immediate Priority formulation of position skills, knowledge, and abilities in the 2nd fiscal quarter of 2015/16, position filled 3rd fiscal quarter of 2015/16. Cost determined by assigned time and pay grade.

#	Recommendations (Fire Dispatching Operational Review, March 2015)	Priority and Implementation
	Customer Service We recommend that, following the implementation of **Recommendation #16** (Governance), **Recommendation #1** (Service Delivery Standards), **Recommendation #5** (Dispatch Policies and Procedures) and **Recommendation #13** (Quality Management Program), a customer service model and evaluation system be developed by the Operations Working Group for Approval by the Steering Committee. Integrated Emergency Services, Halifax Regional Fire & Emergency and Information, Communications and Technology, as partners in the call taking and dispatching system, will need to demonstrate the characteristics of an effective team serving Halifax Regional Municipality in the best interests of public safety.	Short-term priority with the customer service model and evaluation system developed in the 1st and 2nd fiscal quarters of 2016/17, and approval by the Governance Board in the 3rd fiscal quarter of 2016/17.
	Governance Integrated Emergency Services become a separate autonomous business enterprise within the Halifax Regional Municipality organization with a reporting path to the Chief Administrative Officer and that the new business enterprise be renamed to more directly reflect its emergency communications function. An organizational and functional structure comprising a Governance Board, an Operational Working Group, and Agency Working Groups be established.	Immediate Priority with design and implementation during the 1st and 2nd fiscal quarters of 2015/16.
	Implementation and Change Management Strategy The following actions will enable Halifax Regional Fire & Emergency and Integrated Emergency Services to transform to the desired future state: • Assign the role of "change agent" to an individual with strong change management experience, knowledge, and skills. • Use change readiness surveys to measure readiness, identify issues, and monitor progress. • Implement the appropriate training and development to enable employees to succeed in the changed operational environment. • Implement a communication strategy to prepare staff for upcoming changes, encourage participation in change efforts, and monitor adoption or resistance to specific changes. • Communicate the recommendations presented in this report as the positive path to the Optimum Dispatching System for Halifax Regional Municipality.	These recommendations are both Immediate and Long-term Priorities that require oversight and support from the Steering Committee and the leadership of the partner agencies throughout the implementation period of the recommendations, and to ensure the future sustainability of an Optimum Dispatching System for Halifax Regional Municipality.
	Communication Plan	Immediate Priority following approval of recommendations contained in the

#	Recommendations (Fire Dispatching Operational Review, March 2015)	Priority and Implementation
	The Steering Committee ensures implementation of a communication plan that includes the following actions: • Establishes key messages, methods of communication, identify opportunities for two-way communication, and develops a schedule of regular updates for approval by the Steering Committee. • Develops a process of review and approval for all communication to allow for consistent messaging, timely sharing of information, and mitigating the potential for information overload for employees. • Uses a variety of methods for communication, and provide various feedback mechanisms to measure the effectiveness of messages. • Incorporates an approach that will ensure information and messages are consistently shared throughout HRFE and IES. • Schedules periodic face-to-face updates to report on the progress of the changes and supporting activities. • Uses staff meetings, training sessions, and other opportunities for face-to-face discussions to share information and help create understanding about new operating procedures, and build acceptance of the changes among impacted staff.	Halifax Fire Dispatching Operational Review Final Report.

Appendix D: Fire and Emergency Service Delivery Levels – Standards of Response – 2006

9.1.6

HALIFAX
REGIONAL MUNICIPALITY

Halifax Regional Council
February 14, 2006

TO: Mayor Kelly and Members of Halifax Regional Council

SUBMITTED BY: Original Signed
Dan English, Chief Administrative Officer

Original Signed
Wayne Anstey, Acting Deputy Chief Administrative Officer

DATE: February 06, 2006

SUBJECT: **Halifax Regional Fire and Emergency Service Delivery Levels - Standard of Response**

ORIGIN

Fire Services staff have been researching fire service standards since 2001 and on December 13, 2005 during the Council Focus Area presentation for Public Safety, Fire and Emergency Services Chief Eddy indicated he would provide Council with a strategy for the adoption of a service standard for Halifax Regional Municipality.

In addition, at a Regular Council Meeting of March 25, 2003, Councillor Johns requested a staff report on the closure and removal of staff from Station 11, Patton Road Fire Station, Upper Sackville. In discussions with the Councillor, staff advised that the Fire Service were developing a Service Delivery Standard that will address response and resource allocation for all HRM Fire Service.

RECOMMENDATIONS

It is recommended that:

1) Council accept the document "Service Delivery Standards for Halifax Regional Fire and Emergency Service" attached to this report as the desired level of service to be implemented over a multi-year period for the delivery of fire and emergency services to the citizens of the Halifax Regional Municipality by Halifax Regional Fire and Emergency Service.

2) Staff develop a multi-year response strategy for implementation as outlined in this Council report and in accordance with the Business Planning and Budget cycles.

Recommendations Continued on Page 2

3) Council establish the actual service standard for the delivery of fire and emergency services to the citizens of the Halifax Regional Municipality by Halifax Regional Fire and Emergency Service during the balance of the fiscal year 2005-06 at 70% of the desired standard set out in the document "Service Delivery Standards for Halifax Regional Fire and Emergency Service" attached to this report.

BACKGROUND

In 2001, the Chief Director requested an internal committee of fire service managers to review two new service delivery models (one for Career Stations - 1710 & one for Volunteer Stations - 1720), from the National Fire Protection Association (N.F.P.A.). The Committee was tasked to compare our current response criteria to other similar size cities, and how the Halifax Regional Fire and Emergency could establish a minimum benchmark relating to a service delivery model specifically designed for the HRM (Core and Rural).

The key to successful mitigation of emergencies is based on a number of factors, three of the primary ones are: Dispatch, Turnout, and Response times. Several other factors also need to be considered when establishing service levels, including risk to life and property, hazards, and population demographics.

DISCUSSION

When researching and organizing a Halifax Regional Fire and Emergency Service Delivery Standard, the Chief Director allowed the committee the leeway to develop a reasonable and workable standard that did not solely have to be based on the NFPA 1700 series standards. The decision was made to develop recommendations for service levels based on the NFPA 1700 series standards with logical deviations taking into account the diversity of fire protection districts serviced by Halifax Regional Fire and Emergency.

Service level delivery standards proposed encompass the services outlined in **Halifax Regional Municipality Administrative Order 24, Respecting Fire and Emergency Service in Halifax Regional Municipality**. The service delivery standard also provides for an **Acceptable Exemption** when the standard does not apply such as island properties which are not accessible by public roadway, private roads, or properties accessed through travel over privately owned bridges. In these situations, actual response times will be used and will be deemed acceptable under the requirements of the Service Delivery Standard, and will be excluded from the annual calculations.

Also, the Service Delivery Standard provides for an **Extraordinary Exemption**, in order to deal with any natural disasters or other similar conditions, or in the event a State of Emergency has been invoked, the Service Delivery Standard does not apply. Responses under these conditions will be excluded from the annual calculations.

These standards as presented on December 13, 2005 during the Council Focus Areas for Public Safety will provide the Fire Service with a mechanism in which to measure its service delivery as well as provide a strategy to deal with the future growth of Halifax Regional Municipality.

The following outlines the Financial Implications if the full service standards were to be implemented immediately:

Fleet Impact: ***Core (Stations 2 - 18):*** Based on current numbers of apparatus and maintenance of the current fleet reserve there will be no change. This is based on a 20 year replacement schedule. Construction of additional stations will require additional apparatus and this would be based on future growth to meet the proposed delivery standard. ***Rural (Station 19-63)*** A fleet replacement schedule is currently being developed as part of an Overall Fleet Plan. Fleet consolidations will be considered if supporting consolidation of facilities occurs.

Facilities: Based on the adoption in principle of these service delivery standards by Council, HRM Fire & Emergency proposes to undertake a Station Location Study for the entire area serviced by HRM and will develop a station location plan based on the Service Delivery Standard. We presently have a Station Location Study for the urban area dated 1997 which needs to be revisited based upon the acceptance of this Standard due to population growth, proposed development (Regional Plan) and traffic issues. Implications of the interface between the rural and core areas have not been fully studied and may have impact on proposed new stations. This emphasizes the need for an overall study encompassing the entire area serviced by Halifax Regional Fire and Emergency, including those areas currently under contract to other municipalities.

Core (Stations 2 - 18) - the construction of a new fire station (Penhorn) will allow for the consolidation of 2 existing stations (King St. & Woodside). Projected growth between Clayton Park and Bedford will strain the ability to respond from the existing stations and may create the need to construct an additional station in this area. Development in the Morris/Russell Lake areas may have an impact on delivery in those areas which will be considered in the updating of the Station Location Study. We are also studying the need and feasibility of a marine side terminal and firefighting/rescue capability for Halifax Harbour.

Rural (Stations 19 - 63) - station consolidation will be considered based on future fire station location studies. Station locations will be based on these service standards as adopted by Council. Consolidation and future growth will be based on meeting these service level standards. This is dependent upon the financial resources included in future capital budgets.

Initially several facilities may require upgrades to allow for the placement of staff during weekday hours in stations identified as the hub of each response district, in accordance with the Regional Plan. This plan will be phased in over a period of time, as funding allows, in order to fill the identified gap of personnel resources for day-time responses.

Personnel
The full implementation of this service standard would require 81 additional firefighters. This does not include provisions for increase in complement based on the construction of additional stations due to population growth, urban growth, or integration of any Federal Firefighting forces.

Deployment would be in accordance with operational need to meet the goals of the Service Level Standard of four (4) Firefighters per Engine Company, two (2) Firefighters per Aerial Unit and two (2) Firefighters per Rescue Unit.

During this period, our goal is to place staff for day time response coverage in hub stations in the rural districts as identified through the Regional Plan, in order to align services to the Regional Plan. Volunteer turnout and recruitment will be considered when decisions are made to add staff or increase coverage in areas served by volunteer stations.

Because of the financial implications set out in this report, HRM cannot afford to fully implement the full service standard at one time. Therefore the recommendation is to accept the document "Service Delivery Standards for Halifax Regional Fire and Emergency Service" attached to this report as the desired level of service to be aspired to for the delivery of fire and emergency services to the citizens of the Halifax Regional Municipality by Halifax Regional Fire and Emergency Service. Following approval of the desired service level, staff will be requested to develop a multi-year response strategy for implementation in accordance with the Business Planning and Budget cycles. In the meantime, Council will be requested to adopted a more realistic interim standard based on the resources that the Halifax Regional Fire and Emergency Service actually has..

BUDGET IMPLICATIONS

On the approval in principle by Council a multi-year staffing & response plan will be implemented as identified in this report. The goal for the balance of the 2005-06 fiscal period will be an actual service standard for the delivery of fire and emergency services to the citizens of the Halifax Regional Municipality by Halifax Regional Fire and Emergency Service at 70% of the desired standard set out in the document "Service Delivery Standards for Halifax Regional Fire and Emergency Service" attached to this report. This will be a standard based upon the actual resources of Halifax Regional Fire and Emergency Service at the present time. In subsequent years there will be budgetary increases required dependent upon the rate at which Council decides to fully implement the desired standards. This will be determined as part of the Business Planning and Budgetary process.

FINANCIAL MANAGEMENT POLICIES / BUSINESS PLAN

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Capital and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Capital and Operating, as well as any relevant legislation.

REGIONAL PLANNING IMPLICATIONS

Fire & Emergency Service does have representation on the Regional Planning Committee. The purpose of our involvement is to be aware of all new developments and incorporate the projected population density and its impact on Fire Service delivery along with identifying potential future station locations.

ALTERNATIVES

1. To continue to operate without a Service Delivery Standard leaves the Municipality and its Directors open to litigation, fails to ensure that public expectations are met or understood, and does not conform to the Corporate Scorecard Themes.

2. To adopt the NFPA Standards 1710 and 1720 as written. This alternative would result in a significant changes in the number of personnel required to deliver our service and would have significant financial implications to the Municipality.

3. Develop a multi-year strategy based on the budget and business planning process of HRM. This is the recommended alternative.

ATTACHMENTS

1) Service Delivery Standards for Halifax Regional Fire and Emergency Service

Additional copies of this report, and information on its status, can be obtained by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

Report Prepared by: Roy Hollett, Deputy Chief Safety & Strategic Initiatives, 490-5036

Original Signed

Report Reviewed By:
Barb Palmeter, Financial Consultant, 490-7221

Original Signed

Approved by:
Michael E. Eddy, Chief Director, 490-4238

Service Delivery Standards

for

Halifax Regional

Fire and Emergency

November 22, 2005

Table of Contents

Introduction and Background

In 2001, the Chief Director requested an internal committee of Fire & Emergency Chief Officers to look at the current service levels within HRM, and compare them to similar municipalities in an attempt to benchmark and establish service levels for Halifax Regional Fire and Emergency. HRM does not have established service delivery standards for determining acceptable levels of emergency services provided by Halifax Regional Fire and Emergency.

Prior to the 1996 amalgamation of the current HRM, each municipal unit controlled its own Fire Service. This service was (and is today) made up of both career and volunteer Firefighters. In some cases, the two groups worked side by side, and in others, the two rarely interacted. Generally, the local Fire Department was controlled by each respective community, resulting in 38 individual Fire Departments in the current HRM area. These Departments developed and followed their own rules on how they would operate, but their goals were usually the same: arrive at the emergency with as many firefighters as possible. Without minium standards in place, there was no evaluation of the effectiveness or efficiency of the provision of the emergency service, which resulted in a lack of ability to measure anything other than losses related to fire.

The key to successful mitigation of emergencies is based on a combination of factors including Dispatch, Turnout, and Response times (defined later). Several factors need to be considered when establishing service levels, including risk to life and property, hazards and population demographics.

Several municipalities were contacted, and information was obtained electronically where available on the Internet. The service levels provided by these municipalities were compared with the current level of service provided within HRM, in order to establish benchmarks for analysis.

The research by the committee coincided with the international debate over two proposed NFPA (National Fire Protection Association) Standards, **NFPA 1710 'Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments'**, and **NFPA 1720 'Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments'**. These standards have since been adopted by the NFPA.

The Chief Director allowed the committee leeway to develop a workable standard, which did not necessarily have to be based on the NFPA 1700 series standards. The working group has looked at several adopted municipal models, the NFPA 1700 series standards, insurance standards and military standards for providing protection to non-military structures on military bases. The decision was made to develop recommendations for service levels based on the NFPA 1700 series standards, with logical deviations taking into account the diversity of fire protection districts serviced by Halifax Regional Fire and Emergency Service.

Definitions

Due to some confusion around terminology commonly used in Fire & Emergency, the following terms are defined to clarify time intervals and station coverage areas:

Dispatch Time: The point of receipt of the emergency alarm at the public safety answering point, to the point where sufficient information is known to the dispatcher and applicable units are notified of the emergency.

Turnout Time: The time interval from the receipt of the call notification by the station(s) or apparatus, until the time the apparatus notifies the Dispatch Centre that they are en route to the call.

Response Time: The time interval from when the apparatus notifies Dispatch that they are en route to a call, until the time the apparatus notifies Dispatch that they are on scene at the call location, when vehicles are operated at a safe operating speed as defined by policy.

Station Coverage Area: The geographic area that can be covered from an identified station location within a specific time interval.

Fire Response Districts: The geographic boundary of a defined area which is primarily serviced by a specific fire station.

Additional definitions are included in Appendix "A" of this document.

SERVICE DELIVERY OBJECTIVES FOR ALL EMERGENCIES

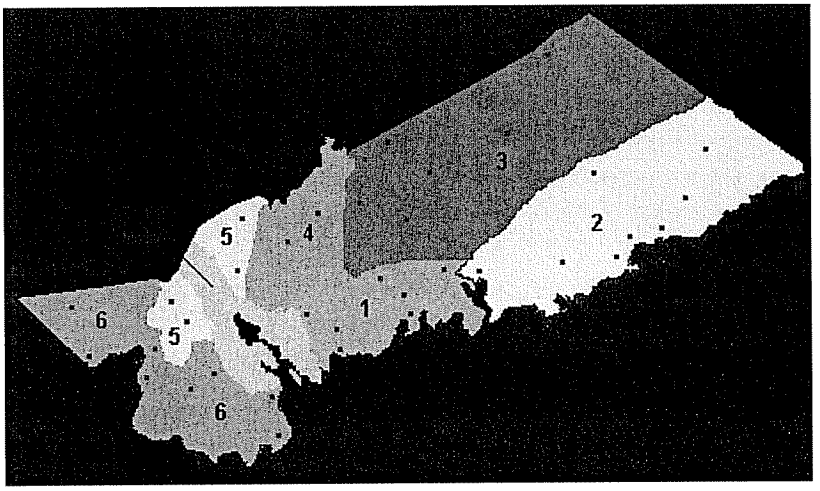
Service level delivery standards are proposed to encompass the services as outlined in Halifax Regional Municipality Administrative Order 24, Respecting Fire and Emergency Service in Halifax Regional Municipality. For a list of services, see Appendix "B" of this document.

Acceptable Exemption: The times for response as indicated in this standard will not apply to island properties which are not accessible by public roadway, private roads, or properties accessed through travel over privately owned bridges. In those situations, the actual response times will be used, will be deemed to be acceptable under the requirements of the Service Delivery Standard, and will be excluded from the annual calculations.

Extraordinary Exemption: Not withstanding any other provisions of this Service Delivery Standard, in order to deal with any natural disasters or other similar conditions, or in the event a State of Emergency has been invoked, the Service Delivery Standard does not apply. Responses under these conditions will be excluded from the annual calculations.

Data Gathering and Analysis:

Benchmark data comparison for response times was done with London, Ontario; Edmonton, Alberta; Indianapolis, Indiana; Vancouver, Washington.; and Kitchener, Ontario. The committee noted with interest that some of the municipalities listed above are currently working on a 5-year project to implement NFPA 1710. The issue in HRM is somewhat more complex, given that the NFPA 1700 series standards are based on either a fire service that is primarily volunteer (NFPA 1720), or a fire service that is primarily career (NFPA 1710). The proposed standard for HRM is essentially a hybrid of the two NFPA 1700 series Standards, accounting for the diversity of the communities that are served by Halifax Regional Fire and Emergency throughout the municipality.



*Red dots indicate Rural Fire Department locations.

Dispatch Time (All Fire Protection Districts)

Accurate verification of Dispatch Time will require implementation of the new CAD/RMS project. Manual verification of calls is the only process that can currently determine accurate Dispatch Time intervals.

Halifax Regional Fire and Emergency will establish a standard which will see a Dispatch Time of 60 seconds or less, 90% of the time, for all fire protection districts.

A one-minute (60 second) Dispatch Time would be in accordance with the NFPA 1710 recommendation, for fire protection districts with a population density of over 100 persons per square kilometer.

A one-minute (60 second) Dispatch Time would be in accordance with the NFPA 1720 recommendation, for fire protection districts with a population density under 100 persons per square kilometer. For structural incidents, this will include a minimum dual station response (Automatic-Aid).

Single unit or single station responses would occur for non-structural incidents through protocols developed by Halifax Regional Fire and Emergency, in consultation with the fire protection districts and other neighboring contract and Mutual Aid Fire Departments.

This Dispatch Time will be audited annually by Halifax Regional Fire and Emergency, in cooperation with 911 Fire Dispatch and an outside source, if required, at the discretion of the Chief Director of Halifax Regional Fire and Emergency. This audit will comply with the intent of the Corporate Scorecard theme of "Safe Communities."

Turnout Time (Fire Protection Districts with population exceeding 100 persons per sq.km)

Turnout Time is available for Stations 2 to 18 (Core). This was analyzed and compared to existing standards and times for other municipalities. It was felt that this data was significant to the areas protected by these stations.

Halifax Regional Fire and Emergency will establish a Turnout Time standard of one (1) minute or less, 90% of the time for Fire Protection Districts 2 to10 and 12 to 18 (Core). This time will be audited annually by Halifax Regional Fire and Emergency and an outside auditor, if deemed necessary by the Chief Director. This audit will comply with the intent of the Corporate Scorecard theme of "Safe Communities."

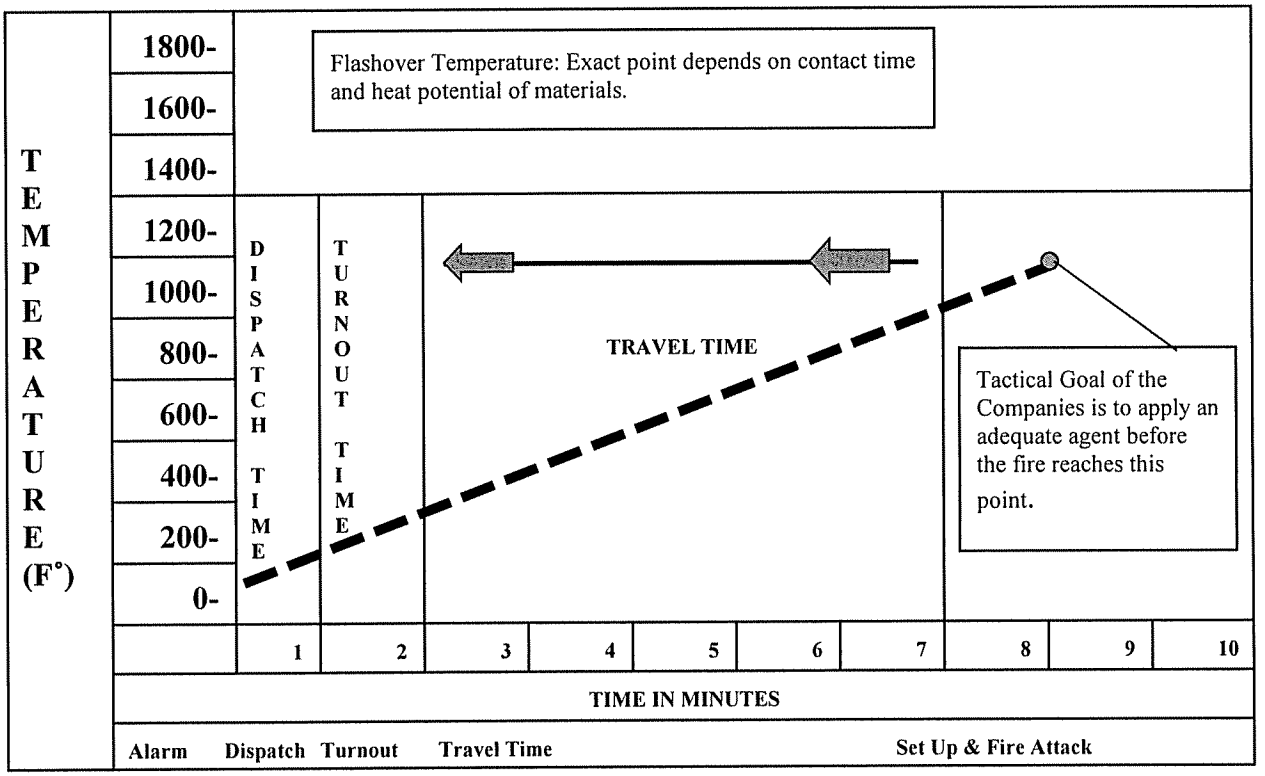
Response Time (Fire Protection Districts with population exceeding 100 persons per sq.km)

Sample data of response times was obtained for Stations 2-18 (Core) from the database currently available to Halifax Regional Fire and Emergency. The data was then analyzed for reporting and recording errors, and 15% of the data which was suspect was eliminated from the final analysis. The calls were then broken down by category, and whether or not the call was a single unit response (involving only one piece of fire apparatus), or a multiple unit response (involving more than one piece of fire apparatus). The details of this analysis were then plotted against the definition provided by the NFPA 1710 Standard. Varying times of response above the time recommended in the Standard were plotted to give an analysis that would allow an imperial value, in this case "time", which would show the gaps in service delivery dependent upon the standard selected. This material is supplied in a mapping format for ease of interpretation. This response data was based on response time being the time from which the fire apparatus departed the station, as recorded by Dispatch, to the time the unit actually arrived on scene.

The International City Manager's Association (ICMA) endorses the concept that in fire stations should be strategically located throughout the city, which would enable the first-arriving pumper to reach a structure fire and apply water before flashover. Flashover is typically considered to occur when the room temperature reaches 1100 °F. It is considered relevant because that is the point at which an unprotected person in that room would not be expected to survive.

The ICMA uses the fire growth characteristics of a residential fire. It is recognized that physical conditions in a residential occupancy (low ceiling heights, relatively small compartments, extensive combustible fuel loadings, etc.), all contribute to an extremely fast-developing fire that will cause a rapid flashover condition. The ICMA's recommended travel time is derived from the time-to-flashover being approximately 8-10 minutes for residential occupancies. Recent data indicates that the time to flashover in residential occupancies may even be quicker due to peoples' tendency to incorporate more and more highly combustible materials into their homes.

Time Versus Products of Combustion



It is recommended that the Response Time standard criteria of five (5) minutes or less, 90% of the time, for the arrival of the first arriving apparatus be adopted by Halifax Regional Fire and Emergency, regardless of the nature of the emergency service to be provided. It is recommended that the Response Time standard criteria of eight (8) minutes or less, 90% of the time, apply to the arrival of additional apparatus dispatched with the first arriving apparatus. For an upgraded alarm, it is recommended that the Response Time standard criteria of eight (8) minutes or less be adopted by Halifax Regional Fire and Emergency, to have a full first alarm assignment on scene 90% of the time. A full alarm assignment will be requested by the first arriving apparatus for structural incidents, or as deemed necessary.

Full Alarm Assignment in the Fire Protection Districts with population exceeding 100 persons per sq. km. will consist of two (2) Engines (1 Officer and 3 crew members each), one (1) Aerial Unit (2 crew members), one (1) Tactical Unit (2 crew members): Total 12 personnel. In addition to the operational personnel, an Incident Safety Officer and Chief Officer to act as a dedicated Incident Commander will also be dispatched.

This standard would be applicable to areas of the HRM with a population density of over 100 persons per square kilometer, and where there are career staff employed in that protection district. Currently this would encompass the majority of the Core, with the exception of Station #11 Fire

Response Area. (Based on estimated population density per square kilometer from calculated civic address population. To be reviewed with the next Stats Canada Population Survey, in conjunction with the Civic Address Population numbers from HRM GIS).

This "time" will be audited annually by Halifax Regional Fire and Emergency, and an outside auditor if deemed necessary by the Chief Director. This audit will comply with the intent of the Corporate Scorecard theme of "Safe Communities."

Turnout Time - Fire Protection Districts with population under 100 persons per sq.km)

Long term data is unavailable for Stations 19 to 63 (Rural: Composite/Volunteer) due to the lack of reliable data prior to the implementation of changes in Dispatch and the radio system. The future capability of verification of data for Stations 19 to 63 (Rural: Composite/Volunteer) has improved with the implementation of the CAD/RMS project.

Halifax Regional Fire and Emergency will establish a Turnout Time standard of six (6) minutes or less, 90% of the time for Stations 19 to 63 (Rural), when the response is by volunteer members.

Stations with career staff (Composite Stations) will meet the turnout time criteria of one minute or less, 90% of the time, when career staff are present.

This "time" will be audited annually by Halifax Regional Fire and Emergency and an outside auditor if deemed necessary by the Chief Director. This audit will comply with the intent of the Corporate Scorecard theme of "Safe Communities."

Response Time - Fire Protection Districts with population under 100 persons per sq.km)

Until the implementation of the proposed CAD/RMS project, there is limited reliable statistical reporting from Stations 19 - 63 (Rural/Composite).

It is recommended that the response standard criteria of ten (10) minutes or less for the arrival of the first arriving apparatus be adopted for fire protection districts that have a population density of under 100 persons per square kilometer. This would include all Rural/Composite Stations and Station 11.

This "time" will be audited annually by Halifax Regional Fire and Emergency, and an outside auditor if deemed necessary by the Chief Director. This audit will comply with the intent of the Corporate Scorecard theme of "Safe Communities."

It is further recommended that fire protection districts with a population density of over 25 persons per square kilometer, have daytime coverage with a minimum of 4 personnel on duty from 0700 to 1800 (these are the peak hours when the majority of responses are likely to occur - Monday to Friday where response by volunteers may be significantly delayed), unless the fire protection district can substantiate, through call records and verifiable data, that the community has adequate daytime coverage by Volunteers, to comply with the service standard for Fire Protection Districts with population under 100 persons per sq/km.

It is further recommended that fire protection districts with a low availability of volunteers during weekday daytime hours, (0700 to 1800) and with specific high occupancy risks (industry, schools, nursing homes, hospitals and seniors complexes), or with a lack of operational membership, consider staffing to a minimum of the above level.

In an effort to support recruitment and retention of volunteers, Halifax Regional Fire and Emergency have received an additional HR support staff member to deal with this North American trend of declining numbers of volunteers.

It is also recommended that when the population density in a fire protection district increases to 50 persons per square kilometer that a mandatory review of the service level in the fire protection district occur. This review must consider the industrial and commercial base of the community, as well as facilities such as schools, hospitals, homes for special care, seniors complexes, etc. The review must demonstrate that the staffing level is adequate, or that the volunteer turnout provides a satisfactory level of fire protection for the fire protection district. It may be appropriate in some communities to consider implementation of 24-hour coverage, with a minimum of four personnel, due to coverage and turnout issues.

Once a fire protection district has a population density that exceeds 90 persons per square kilometer, consideration should be given to future growth and development, in order to plan for the station to be able to provide response in accordance with the service standard, for fire protection districts with population density exceeding 100 persons per square kilometer.

Alternative staffing proposals for stations in close proximity to each other may result in a higher level of staffing responding from a single station, in order to provide a more efficient and effective level of service delivery. This should be considered if the service level delivery for the combined fire protection districts can be verified against the criteria, as addressed above.

Fleet:

Core (Stations 2 - 18): Based on current numbers of apparatus and maintenance of the current fleet reserve, there will be no change. This is based on a 20-year replacement schedule. Construction of additional stations will require additional apparatus, and this would be based on future growth to meet the proposed delivery standard.

Rural (Stations 19-63): A fleet replacement schedule is currently being developed as part of an Overall Fleet Plan, and will be followed based on adequate funding being provided through the Rural Tax Structure, to create a sufficient reserve to allow for fleet maintenance and replacement. Fleet consolidations will be considered if supporting consolidation of facilities occurs.

Facilities:

As part of this Service Standard, Halifax Regional Fire and Emergency proposes to undertake a Station Location Study for the entire area serviced by HRM, and will develop a Station Location Plan based on the Service Delivery Standard. We presently have a Station Location Study for the urban area dated 1997, which will be revisited based upon this Standard because of population growth, proposed development (Regional Plan) and traffic issues. Implications of the interface between the Rural and Core areas have not been fully studied, and may have an impact on proposed new stations. This emphasizes the need for an overall study encompassing the entire area serviced by Halifax Regional Fire and Emergency, including those areas currently under contract to other municipalities.

Core (Stations 2 - 18):

The construction of a new fire station (Penhorn) will allow for the consolidation of 2 existing stations (King St. & Woodside). Projected growth between Clayton Park and Bedford will strain the ability to respond from the existing stations and may create the need to construct an additional station in this area. Development in the Morris/Russell Lake areas may have an impact on delivery in those areas, which will be considered in the updating of the Station Location Study. We are also studying the need and feasibility of a marine-side terminal, and firefighting/rescue capability for Halifax Harbour.

Rural (Stations 19 - 63):

Station consolidation will be considered based on future fire station location studies. Station locations will be based on the service standard. Consolidation and future growth will be based on meeting these service level standards. Adequate financial resources will need to be included in future capital budget proposals.

Initially several facilities may require upgrades to allow for the placement of staff during weekday hours in stations identified as the hub of each response district, in accordance with the Regional Plan. This plan will be phased in over a period of time, as funding allows, in order to fill the identified gap of personnel resources for daytime responses.

Training Facilities:

The current training facilities utilized by Halifax Regional Fire and Emergency were constructed by the former City of Halifax in the mid-1980's to support 6 fire stations and approximately 220 members. No provisions were made for expansion, and the use of live fire training structures. This facility has a use as a primary training facility for pump operations, engineer driver training and aerial operational training, due to the exceptional water supply provided to the site. However, there

is a significant need for a fire training facility which will allow for year-round live fire, flashover and natural gas training, as well as CBRN (Chemical, Biological, Radiological, Nuclear), confined space, trench rescue, collapse rescue and high angle technical rescue training. If properly designed and funded, the facility could be utilized for vehicle extrication training, hazardous materials response training and could be used by other municipal departments for trench training, confined space training, natural gas and driver training. A Capital Reserve is proposed at $1,000,000 per year for 3 years, to provide a facility that will allow Halifax Regional Fire and Emergency members to maintain required levels of training. Federal Funding of $1,000,000 dollars is available on a cost-sharing basis from the Federal Joint Emergency Preparedness Program: Urban Search and Rescue Project for a training facility.

Personnel

Based on the implementation of this Service Standard, the current situation will require an increase in personnel complement. This does not include provisions for increase in complement based on the construction of additional stations due to population growth, urban growth, or integration of any Federal firefighting forces.

Future staffing increases will be phased in through the Business Planning process and available budget allocations.

Summary of Recommendations

A. For Fire Protection Districts with population density exceeding 100 persons per square kilometer.

1) A dispatch time of 60 seconds be established as a standard by HRM.

2) A turnout time of 60 seconds be established as a standard by HRM.

3) A response time of 5 minutes, or less - 90% of the time be established for single unit responses, or for the first arriving unit of a multiple unit response.

4) A response time of 8 minutes, or less - 90% of the time be established for subsequent arriving units of a multiple unit response or alarm assignment.

5) A full alarm assignment consists of 2 Engines, 1 Aerial, 1 Tactical Unit, for a total of 12 personnel.

6) An Incident Safety Officer and a dedicated Incident Commander will be dispatched on full alarm assignments, with no response time criteria.

7) A subsequent alarm assignment consists of a minimum of 2 units (configuration acceptable to the Incident Commander) for a total of 8 additional personnel.

B. For Fire Protection Districts with population density under 100 persons per square kilometer.

1) A dispatch time of 60 seconds be established as a standard by HRM.

2) Staff Turnout: A turnout time of 60 seconds be established as a standard by HRM.

Volunteer Turnout: A turnout time of 6 minutes or less - 90% of the time be established as a standard by HRM.

3) A response time of 10 minutes or less - 90% of the time be established as a standard by HRM.

C. Annual Auditing

Annual auditing is recommended for all service delivery standards. This will allow for confirmation of service levels and serve as a planning tool for future growth.

1) A population density of more than 25 persons per square kilometer will require a review, to determine the need for daytime coverage by career staff. Verifiable data of volunteer turnout to the standard during daytime hours, to meet the turnout and response criteria established as a standard by HRM.

2) A population density of more than 50 persons per square kilometer will require a review to determine the need for daytime coverage by career staff. This review must also consider infrastructure, industry and high occupancy risks. Verifiable data of volunteer turnout of sufficient numbers to provide protection services on a consistent basis must be provided, or consideration given to providing either daytime or 24-hour staff.

3) A population density of more than 90 persons per square kilometer will require a review to determine the need to plan for future growth and provision of services, once the population density exceeds 100 persons per square kilometer.

4) Alternative staffing proposals for stations in close proximity can be proposed/considered and implemented to provide more effective and efficient service delivery, provided the turnout and response criteria for each protection district can be met.

Appendix "A"

Definitions:

Alarm Time: The point of receipt of the emergency alarm at the public safety answering point, to the point where sufficient information is known to the Dispatcher to deploy applicable units to the emergency.

Apparatus: A motor-driven vehicle or group of vehicles designed and constructed for the purpose of fighting fires.

Company Officer: A supervisor of a crew/company of personnel.

Dispatch Time: The point of receipt of the emergency alarm at the public safety answering point, to the point where sufficient information is known to the Dispatcher and applicable units are notified of the emergency.

Emergency Operations: Activities of the fire department relating to rescue, fire suppression, emergency medical care, and special operations, including response to the scene of the incident and all functions performed at the scene.

Fire Apparatus: A fire department emergency vehicle used for rescue, fire suppression, or other specialized functions.

Initial Full Alarm Assignment: Those personnel, equipment, and resources ordinarily dispatched upon notification of a structural fire.

Initial Attack: Firefighting efforts and activities that occur in the time increment between the arrival of the fire department on the scene of a fire, and the tactical decision by the Incident Commander that the resources dispatched on the original response will be insufficient to control and extinguish the fire, or that the fire is extinguished.

Initial Rapid Intervention Crew (IRIC): Two members of the initial attack crew who are assigned for rapid deployment to rescue lost or trapped members.

Public Service Answering Points (PSAP): Any facility where 911 calls are answered, either directly or through rerouting.

Rapid Intervention Crew (RIC): A dedicated crew of firefighters who are assigned for rapid deployment to rescue lost or trapped members.

Rescue: Those activities directed at locating endangered persons at an emergency incident, removing those persons from danger, treating the injured, and providing for transport to an appropriate health

care facility.

Response Time: The time that begins when units are en route to the emergency incident, and ends when units arrive at the scene.

Structural Firefighting: The activities of rescue, fire suppression, and property conservation in buildings, enclosed structures, aircraft interiors, vehicles, vessels, aircraft, or like properties that are involved in a fire or emergency situation.

Supervisory Chief Officer: A member whose responsibility is to assume command through a formalized transfer of command process, and to allow company officers to directly supervise personnel assigned to them.

Sustained Attack: The activities of fire confinement, control, and extinguishment that are beyond those assigned to the initial responding companies.

Turnout Time: The time interval from the receipt of the call notification by the station(s) or apparatus, until the time the apparatus notifies the Dispatch Centre that they are en route to the call.

Appendix "B"

The Halifax Regional Fire and Emergency Service has committed to provide an emergency service to the following (In Accordance With: HALIFAX REGIONAL MUNICIPALITY ADMINISTRATIVE ORDER NUMBER 24 RESPECTING FIRE AND EMERGENCY SERVICE IN HALIFAX REGIONAL MUNICIPALITY)

Fire and Fire Related Emergencies:

Structural and Wildland:	Offensive and Defensive
Medical Response:	Medical First Responder
Vehicle Rescue:	Operational
Water Rescue:	Operational
Ice Rescue:	Operational
Structure Rescue:	Operational
Confined Space:	Operational
High Angle Rescue:	Operational
Hazardous Materials:	Operational
Search and Rescue:	Assistance (Ground Search & Rescue)
Fire Prevention/Education:	Inspections, Investigations, Public Education

Population Density by Fire Response District

Halifax Regional Fire and Emergency

February 7, 2012

District	Sq km	Pop per sq km
2	8.01	3001.20
3	4.12	4349.25
4	5.74	2242.02
5	8.80	2611.56
6	37.03	589.52
7	30.57	1152.77
8	24.24	963.58
9	38.61	553.14
10	28.60	470.99
11	43.15	90.93
12	33.03	371.00
13	26.72	524.12
14	20.52	1012.84
15	10.31	904.27
16	68.55	180.03
17	31.74	926.00
18	37.97	322.12
19	81.90	26.41
20	66.20	54.75
21	92.33	56.42
22	23.40	34.70
23	192.96	33.44
24	223.71	10.01
25	66.49	8.60
26	575.36	4.19
28	716.50	2.04
29	187.21	2.61
30	292.52	2.80
32	254.60	0.77
33	232.47	1.78
34	34.91	3.61
35	88.46	5.72
36	243.57	2.82
38	239.87	4.93
39	813.53	1.40
40	97.42	18.13
41	90.47	37.98
42	47.09	49.90
43	24.82	42.96
45	32.18	210.52
47	222.89	1.03
48	124.15	37.23

District	Sq km	Pop per sq km
50	135.30	76.61
52	73.70	49.89
54	146.40	31.91
55	154.57	17.30
56	277.47	8.12
58	47.09	208.41
60	37.66	71.98
61	33.09	25.58
62	39.91	44.03
63	97.66	18.51
65	202.35	52.32

Above 100 Persons per Sq km	Below 100 Persons per Sq km

Appendix E: Pomax Population Density Maps

Halifax Fire Standards Review
Population by Dissemination Block, Urban Core

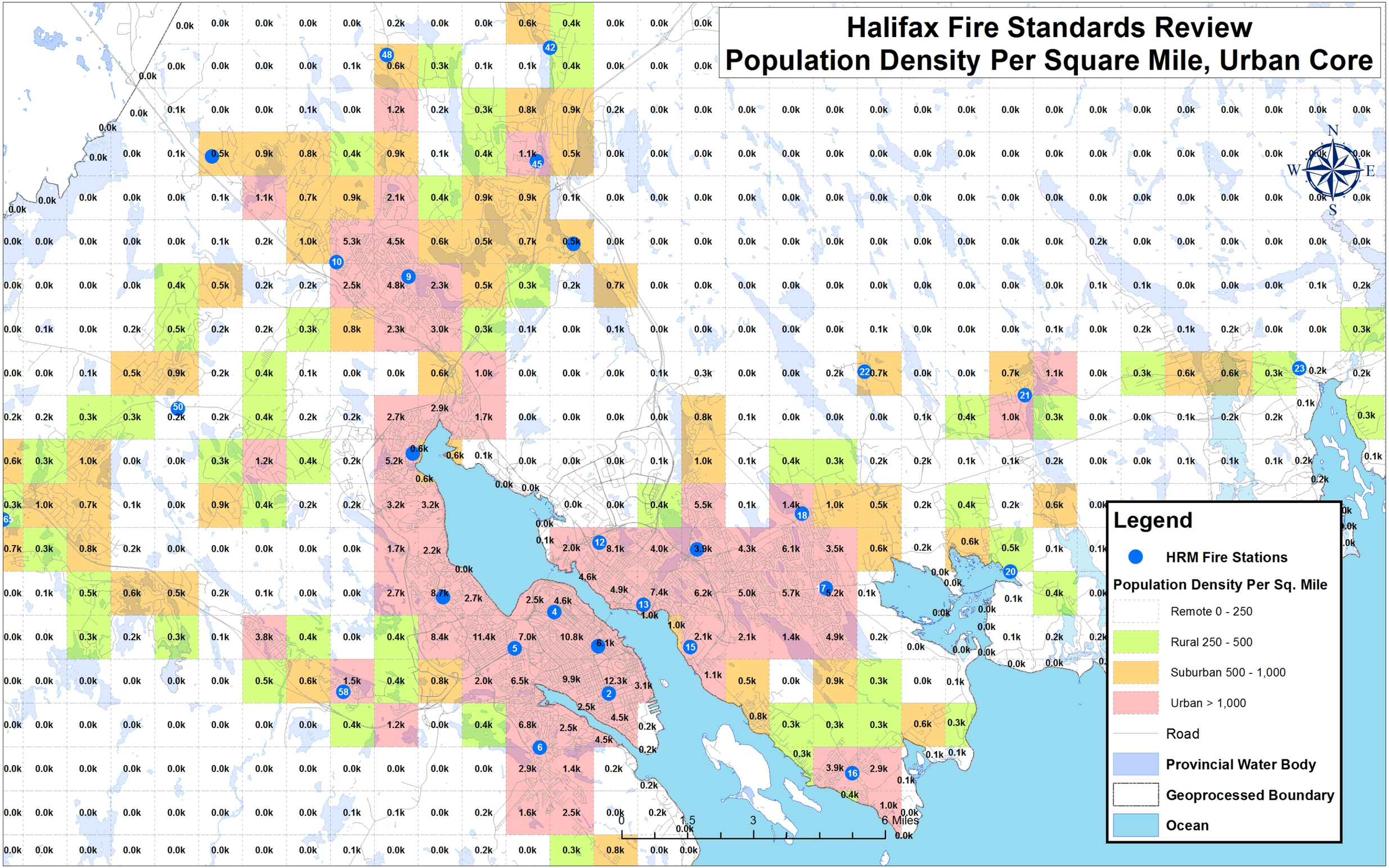
N
W
E
S

Legend

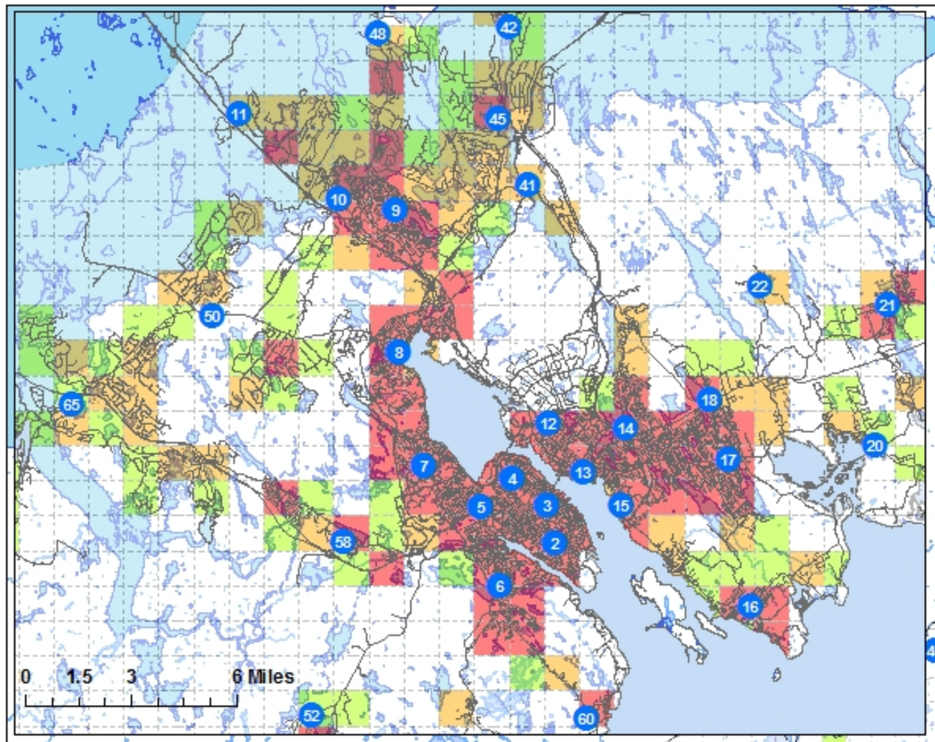
- HRM Fire Stations
- Provincial Water Body
- Geoprocessed Boundary
- Ocean

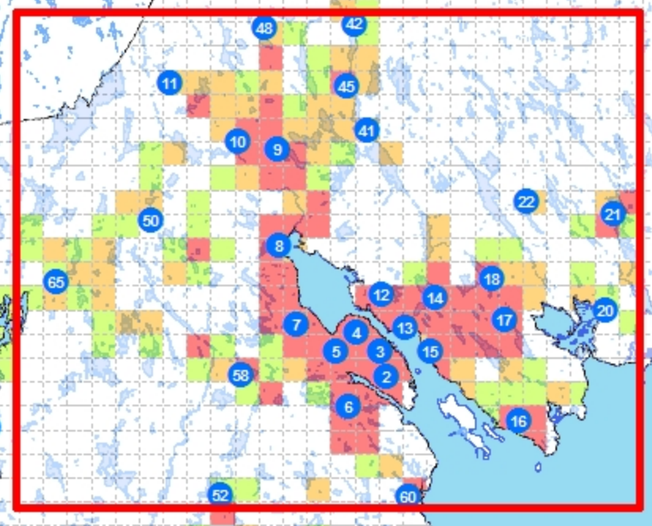
0 0.75 1.5 3 Miles

Halifax Fire Standards Review
Population Density Per Square Mile, Urban Core



Halifax Fire Standards Review
Population Density Per Square Mile





N
W E
S

0 5 10 20 Miles

Legend

- HRM Fire Stations

Population Density Per Sq. Mile

- Remote 0 - 250
- Rural 250 - 500
- Suburban 500 - 1,000
- Urban > 1,000
- Geoprocessed Boundary
- Provincial Water Body
- Ocean

Appendix F: NFPA 1710 and 1720 Deployment Charts

NFPA Deployment Chart – NFPA 1710 (2016 Edition)

Incident Description	Turnout Time[13]	Travel Time[14] Initial Response Unit	Number Initial Responders	Full Alarm Travel Time	Total Number Responders Full Alarm Assignment	Document Section/Annex
Single Story, Detached 186 sq.m /no basement	EMS – 60 seconds Fire – 80 seconds (4.1.2.1(2))	240 seconds (4.1.2.1(3))	4 (5.2.3.1.1)	480 seconds (4.1.2.1(4))	14; 15 if aerial device employed	5.2.4.1
Open Air Strip Shopping Centre (1203 sq. m – 18,209 sq. m)	Fire – 80 seconds (4.1.2.1(2))	240 seconds (4.1.2.1(3))	4 (5.2.3.1.1)	480 seconds (4.1.2.1(4))	25; 26 if aerial device employed + 2 EMS	5.2.4.2 A.5.2.4.2.1
Apartment 111 sq. m/ 3 stories	Fire – 80 seconds (4.1.2.1(2))	240 seconds (4.1.2.1(3))	4 (5.2.3.1.1)	480 seconds (4.1.2.1(4))	25; 26 if aerial device employed + 2 EMS	5.2.4.3
High Rise (building over 23 m)	Fire – 80 seconds (4.1.2.1(2))	240 seconds (4.1.2.1(3))	4 (5.2.3.1.1)	610 seconds (4.1.2.1 (5))	36; 37 if building equipped with fire pump	5.2.4.4

Notes:

i. Fire apparatus are normally staffed with a minimum of four on-duty members

ii. In jurisdictions with tactical hazards, high-hazard occupancies, or dense urban areas, as identified by the authority having jurisdiction (AHJ), these fire companies shall be staffed with a minimum of six on-duty members. These occupancies include schools, hospitals, and other special medical facilities, nursing homes, high-risk residential occupancies, neighbourhoods with structures in close proximity to one another, high-rise buildings, explosives plants, refineries, and hazardous materials occupancies.

iii. A cascade of events chart can be found in Annex 3.3.53.6

[13] **Turnout time**: The time interval that begins when the emergency response facilities (ERFs) and emergency response units (ERUs) notification process begins by either an audible alarm or visual annunciation, or both, and ends at the beginning point of travel time.

[14] **Travel time**: The time interval that begins when a unit is en route to the emergency incident and ends when the unit arrives at the scene.

NFPA 1720 (2014 Edition)

Demand Zone[15]	Demographics	Minimum Staffing Required[16]	Response Time[17] (minutes)	Meets Objective (%)
Urban	>1,000 people /2.6 sq. km	15	9	90
Suburban	500–1,000 people /2.6 sq. km	10	10	80
Rural	< 500 people / 2.6 sq. km	6	14	80
Remote	Travel distance > 12.8 km	4	Dependent on travel distance	90
Special Risk	Determined by AHJ	Determined by AHJ based on risk	Determined by AHJ	90
Activity	**Minimum on Scene**	**Initial Attack Time**	**Document Section**	
Interior Fire Suppression	4	2 minutes after assembly of necessary resources on scene	4.6	90
Sustained Firefighting Operations	Sufficient personnel, equipment, and resources	Determined by AHJ	4.7	Determined by AHJ

[15] A jurisdiction may have more than one demand zone.
[16] Minimum staffing includes members responding from the AHJs department and automatic aid.
[17] Response time begins with the completion of dispatch notification and ends at the time interval shown in the table.

Appendix G: National Institute of Standards Technology

This appendix provides information on the National Institute of Standards and Technology (NIST) study pertaining to the effect of response times and number of responders in structure fire scenarios.

Rationale of Response Times and Number of Responders

The critical factors to be considered for optimum response to structure fires is speed of response, equipment adequacy, and the number of trained responders.

Crew size

The following information is provided to emphasize the impact of crew size on effectiveness in mitigating a fire emergency. Although this information has specific relevance to response by full-time stations, it demonstrates the capability of a firefighting crew regardless of the fire crew composition (career, composite, or volunteer).

In a rapidly developing fire scenario, two critical factors impacting the outcome are

- effectiveness of the chosen strategy, and
- timeliness for completion of the tasks necessary to successfully implement the strategy.

The number of firefighters available to undertake the required tasks has a direct impact on the time required to complete the tasks and ultimately determines the outcome of the emergency response. In 2010, NIST[18] undertook a study to ascertain the effectiveness of fire crews of varying size (two-, three-, four-, and five-person crews) responding to a basic, 2,000-square-foot, two-story residential structure fire.

National Institute of Standards and Technology Study–Primary Findings

Of the 22 fireground tasks measured during the experiments, results indicated that the following factors had the most significant impact on the success of firefighting operations. All differential outcomes described below are statistically significant at the 95% confidence level or better.

Overall Scene Time

Four-person crews operating on a low-hazard structure fire completed all the tasks on the fireground (on average) 7 minutes faster—nearly 30%—than two-person crews. Four-person crews completed the same number of fireground tasks (on average) 5.1 minutes faster—nearly 25%—than the three-person crews. On the low-hazard residential structure fire, adding a fifth person to the crews did not decrease overall fireground task times. However, the benefit of five-person crews has been documented in other evaluations to be significant for medium- and high-hazard structures, particularly in urban settings, and is recognized in industry standards.

[18] http://www.nist.gov/el/fire_research/upload/Report-on-Residential-Fireground-Field-Experiments.pdf

Time to Water on Fire

There was a 10% difference in the "water on fire" time between the two- and three-person crews. There was an additional 6% difference in the water on fire time between the three- and four-person crews. (i.e., four-person crews put water on the fire 16% faster than two-person crews). There was an additional 6% difference in the water on fire time between the four- and five-person crews (i.e., five-person crews put water on the fire 22% faster than two-person crews).

Ground Ladders and Ventilation

The four-person crews operating on a low-hazard structure fire completed laddering and ventilation (for life safety and rescue) 30% faster than the two-person crews and 25% faster than the three-person crews.

Primary Search

The three-person crews started and completed a primary search and rescue 25% faster than the two-person crews. The four- and five-person crews started and completed a primary search 6% faster than the three-person crews and 30% faster than the two-person crews. A 10% difference was equivalent to just over 1 minute.

Hose Stretch Time

In comparing four- and five-person crews to two- and three-person crews collectively, the time difference to stretch a line was 76 seconds. The differences are more distinct when conducting a more specific analysis comparing all crew sizes to the two-person crews. Two-person crews took 57 seconds longer to stretch a line than three-person crews. Two-person crews took 87 seconds longer than four-person crews to complete the same tasks. Finally, the most notable comparison was between two-person crews and five-person crews: more than 2 minutes' (122 seconds) difference in task completion time.

Industry Standard Achieved

As defined by NFPA 1710, the "industry standard achieved" time started from the first engine arrival at the hydrant and ended when 15 firefighters were assembled on scene. An effective response force was assembled by the five-person crews 3 minutes faster than the four-person crews. Based on the study protocols, modelled after a typical fire department apparatus deployment strategy, the total number of firefighters on scene in the two- and three-person crew scenarios never equalled 15. Therefore, the two- and three-person crews were unable to assemble enough personnel to meet this standard.

Occupant Rescue

Three different "standard" fires were simulated using the Fire Dynamics Simulator model. Characterized in the *Handbook of the Society of Fire Protection Engineers* as slow, medium, and fast growth rate, the fires grew exponentially with time. The rescue scenario was based on a non-ambulatory occupant in an upstairs bedroom with the bedroom door open.

Independent of fire size, there was a significant difference between the toxicity, expressed as fractional effective dose (FED), for occupants at the time of rescue depending on arrival times for all crew sizes.

Occupants rescued by early arriving crews had less exposure to combustion products than occupants rescued by late-arriving crews.

The fire modelling showed clearly that two-person crews could not complete essential fireground tasks in time to rescue occupants without subjecting them to an increasingly toxic atmosphere. For a slow growth rate fire with two-person crews, the FED was approaching the level at which sensitive populations, such as children and the elderly, are threatened. For a medium growth rate fire with two-person crews, the FED was far above that threshold and approached the level affecting the general population. For a fast growth rate fire with two-person crews, the FED was well above the median level at which 50% of the general population would be incapacitated.

Larger crews responding to slow growth rate fires can rescue most occupants prior to incapacitation, as can early arriving larger crews responding to medium growth rate fires. The result for late-arriving (2 minutes later than early arriving) larger crews may result in a threat to sensitive populations for medium growth rate fires. However, statistical averages should not mask the fact that no FED level is so low that every occupant in every situation is safe.

Conclusion

More than 60 full-scale fire experiments were conducted to determine the impact of crew size, first-due engine arrival time, and subsequent apparatus arrival times on firefighter safety and effectiveness at a low-hazard residential structure fire. The NIST report quantifies the effects of changes to staffing and arrival times for residential firefighting operations. While resource deployment is addressed in the context of a single structure type and risk level, it is recognized that public policy decisions regarding the cost–benefit of specific deployment decisions are a function of many other factors including geography, local risks and hazards, available resources, and community expectations. The NIST report does not specifically address these other factors.

The results of these field experiments contribute significant knowledge to the fire service industry. First, the results provide a quantitative basis for the effectiveness of four-person crews for low-hazard response in NFPA 1710. The results also provide valid measures of total effective response force assembly on scene for fireground operations, as well as the expected time-to-critical-task performance measures for low-hazard structure fires. Additionally, the results provide tenability measures associated with a range of modelled fires.

Response Time

Total response time to a fire emergency has a number of components. The stages of response and rationale for timely response are detailed below.

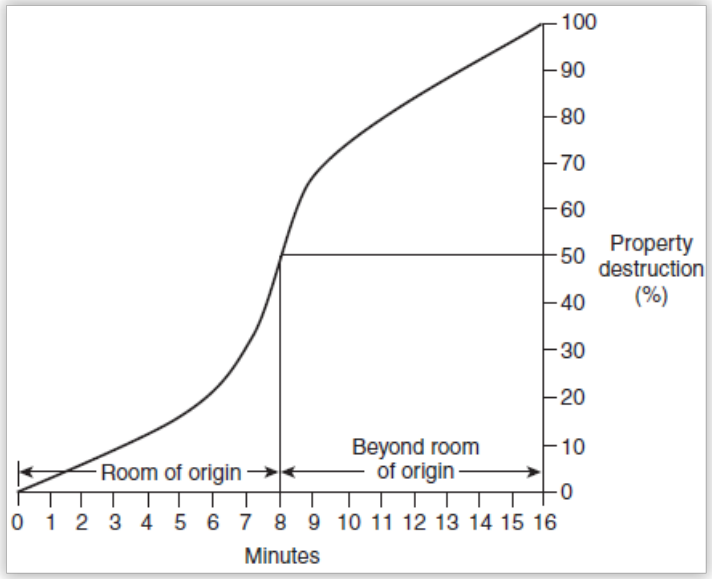
NFPA 1710[19] states,

> *the progression of a structure fire to the point of flashover (i.e., the very rapid spreading of the fire due to superheating of room contents and other combustibles) generally occurs in less than 10 minutes. Two of the most important elements in limiting fire spread are the quick arrival of sufficient numbers of personnel and equipment to attack and extinguish the fire as close to the point of its origin as possible.*[20]

For clarity, the two elements are a rapid response and sufficient fire fighters and equipment.

As indicated in the Fire Propagation Curve (Figure 1), within 8 minutes 50% property destruction has occurred. After 10 minutes, the area of origin has flashed over and spread outside the area of origin, making it more difficult to extinguish the fire.

Figure 1: Fire Propagation Curve



When considering the total response time of an agency, NFPA 1221 and 1710 must be considered together. The important relationship between alarm handling time, turnout, and travel time is explained in NFPA 1710, which describes the three phases of total response time as:

> **Phase One**: Alarm handling time, which includes alarm transfer time, alarm answering time, and alarm processing time (addressed by NFPA 1221) (phone rings, phone is answered and information gathered, incident information is transferred to fire responders).

[19] Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments

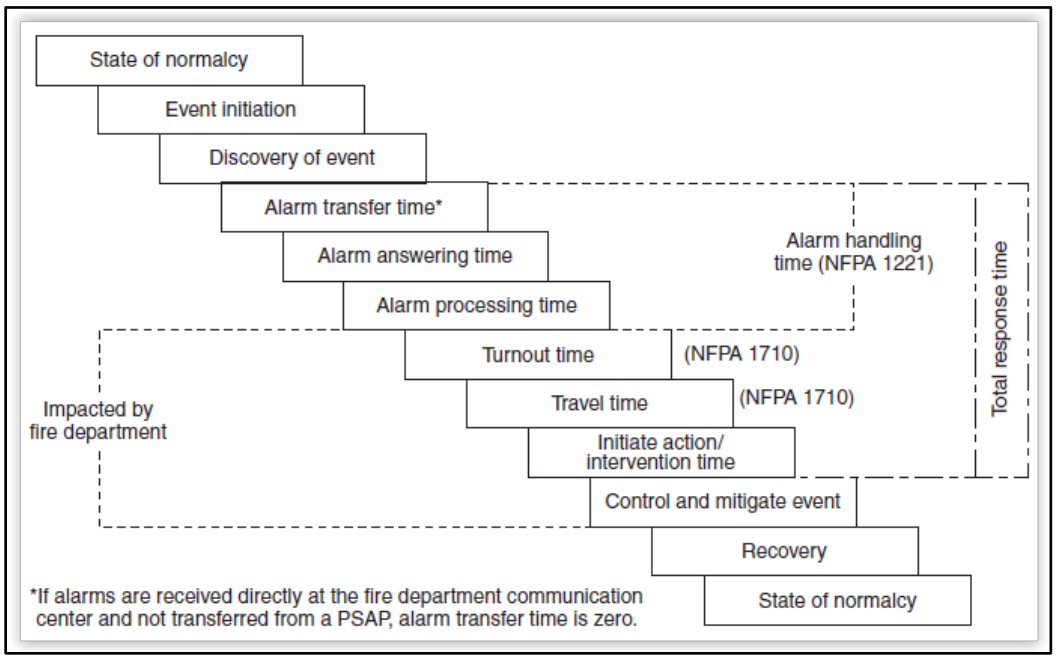
[20] NFPA 1710: table A.5.2.2.2.1.

Phase Two: Turnout time and travel time (addressed by NFPA 1710) (firefighters don protective clothing and drive to the incident).

Phase Three: Initiating Action/Intervention time (not addressed by a single NFPA standard).

The Cascade of Events chart (Figure 2) illustrates the relationship between the three phases of total response time: alarm handling time, turnout and travel time, and initiating action/intervention time.

Figure 2: Cascade of Events Chart



NFPA 1710, based on fire propagation and flashover expectations, specifies a travel time of 4 minutes for the first responding crew of 4 firefighters and an 8-minute travel time for arrival of the initial full alarm assignment of 14/15 personnel.

This standard is voluntary and places no statutory responsibility on a municipality; it states,

> *The ability of adequate fire suppression forces to significantly influence the outcome of a structure fire is undeniable and predictable. Data generated by NFPA and used by the committee in developing this standard provide empirical data that rapid and aggressive interior attack can substantially reduce the human and property losses associated with structure fires.*

Table 5 is extracted from NFPA 1710 and indicates the impact of rapid intervention in the event of a structure fire. Although based on US information, it demonstrates the advantage of confining and containing fires.

Table 5: NFPA 1710 Table A.5.2.2.2.1 (b)

Flame Spread	Civilian Deaths	Civilian Injuries	Average Loss (USD) per Fire
Confined fire or contained fire identified by incident type	0.000	10.29	$212
Confined fire or flame damage confined to object of origin	0.65	13.53	$1,565
Confined to room of origin, incl. confined fires and fires confined to object	1.91	25.32	$2,993
Beyond the room but confined to floor of origin	22.73	64.13	$7,445
Beyond floor of origin	24.63	60.41	$58,431

HALIFAX REGIONAL MUNICIPALITY
ADMINISTRATIVE ORDER NUMBER 2018-OP-006
RESPECTING HALIFAX REGIONAL FIRE & EMERGENCY IN THE
HALIFAX REGIONAL MUNICIPALITY

BE IT RESOLVED as an Administrative Order of the Council of the Halifax Regional Municipality pursuant to the *Halifax Regional Municipality Charter* as follows:

SHORT TITLE

1. The Administrative Order may be cited as the *Halifax Regional Fire & Emergency Administrative Order*.

INTERPRETATION

2. In this Administrative Order,

(a) "Council" means the Council of the Municipality;

(b) "Emergency Management Co-Ordinator" means the Division Chief of Emergency Management to co-ordinate resources of the Municipality during major emergencies, and reporting to the Fire Chief;

(c) "Fire Chief" means the senior official appointed by Council, within and in charge of Halifax Regional Fire & Emergency.

(d) "Halifax Regional Fire & Emergency" means all full-time, composite, and volunteer fire fighting and emergency management services provided by the Municipality;

(e) "Member" means an employee, volunteer or career firefighter employed by Halifax Regional Fire & Emergency; and

(f) "Municipality" means the Halifax Regional Municipality.

PART I
HALIFAX REGIONAL FIRE & EMERGENCY

DEPARTMENT

3. (1) Halifax Regional Fire & Emergency is continued as a fire department as originally registered pursuant to Section 294 of the *Municipal Government Act*.

(2) No other body corporate may be approved for registration as a fire department to the Municipality for the same services provided by Halifax Regional Fire & Emergency.

(3) Halifax Regional Fire & Emergency shall endeavor to provide the emergency services designated in Part IV to the whole of the Municipality.

(4) Halifax Regional Fire & Emergency may provide fire and emergency services by providing the service, assisting others to provide the service, working with others to provide the service, or a combination of means.

FIRE CHIEF

4. (1) The Director of Halifax Regional Fire & Emergency shall be the Fire Chief.

(2) The Fire Chief shall administer the day to day business affairs of Halifax Regional Fire & Emergency in accordance with the policies, plans, and budgets approved by Council.

(3) The Fire Chief will advise the Chief Administrative Officer or their delegate, and Council at least annually with respect to the provision of efficient, effective, and economical fire and emergency services.

(4) The Fire Chief shall have under their direction and control all members constituting Halifax Regional Fire & Emergency, and they shall be responsible for keeping discipline in the fire service.

(5) The Fire Chief may appoint one or more employees as a Deputy Chief Officer and organize staff who shall assist the Fire Chief in the discharge of their duties and for such purposes a Deputy Chief Officer shall have like powers as the Fire Chief when acting as a Fire Chief, provided that at all times a Deputy Chief Officer(s) shall be subject to the lawful direction of the Fire Chief.

(6) A Deputy Chief Officer shall, in the case of the Fire Chief's absence from the Municipality, vacation, illness or other incapacity, or during a vacancy in the office of the Fire Chief, have all the powers and privileges of the Fire Chief and perform all the duties of the Fire Chief.

(7) The Fire Chief may delegate their powers and responsibilities as they see fit.

(8) The Fire Chief may, with the approval of the Chief Administrative Officer, reorganize or realign Halifax Regional Fire & Emergency to improve service or increase regulatory compliance.

(9) The Fire Chief may enter into an agreement to provide fire and emergency services, or obtain fire and emergency services from another municipality or registered fire department. Services provided to the Municipality under such circumstances shall be defined by contract, automatic aid and/or mutual aid agreement, and shall outline the type and level of services.

QUALIFICATIONS

5. (1) No person shall be eligible for entry in Halifax Regional Fire & Emergency either on a full time, part time, or voluntary basis unless the person meets the criteria as developed by the service.

(2) The Fire Chief may appoint to Halifax Regional Fire & Emergency any person qualified under subsection (1) when a vacancy occurs through the death, retirement, resignation, or discharge of a member with the result that the complement of Halifax Regional Fire & Emergency is below the staff complement approved by Council, or where the Council increases the staff complement of Halifax Regional Fire & Emergency .

(3) Any firefighter hired by Halifax Regional Fire & Emergency shall be employed for a probation period of one year during which time the Fire Chief may summarily dismiss any such firefighter if, in the opinion of the Fire Chief, such firefighter is unsuitable to continue to be a member of Halifax Regional Fire & Emergency.

PROMOTIONS

6. (1) The Fire Chief may summarily reduce the rank of any member of Halifax Regional Fire & Emergency within one year from the date of the appointment, or thereafter with sufficient grounds, if in the opinion of the Fire Chief, such member is incapable of properly performing or has failed to perform properly the duties pertaining to such rank or is otherwise unsuitable to hold such rank.

(2) The Fire Chief may summarily extend the probationary period of a member in any rank for up to one additional year if the Fire Chief has reservations about the performance of such member in that rank.

(3) Nothing in this Section is intended to amend the provisions of any collective agreement in place from time to time in respect of the employment of any members of Halifax Regional Fire & Emergency and this Section shall be interpreted to be consistent with the provisions of such collective agreements as may be in place from time to time.

DISCIPLINE

7. (1) Without restricting the generality of Section 4, the Fire Chief shall have the power to hire, discharge, transfer, promote, demote, suspend and otherwise discipline any member of Halifax Regional Fire & Emergency.

(2) In exercising their jurisdiction pursuant to subsection (1), the Fire Chief shall comply with any applicable provisions of any collective agreement in force and effect from time to time.

(3) The Fire Chief may delegate any of the powers pursuant to subsection (1) to Deputy or Assistant Chief Officers of Halifax Regional Fire & Emergency.

PART II
MUNICIPAL EMERGENCY MANAGEMENT COORDINATION

EMERGENCY MANAGEMENT

8. (1) The coordinated response to emergencies within the Municipality as outlined in the *Emergency Management By-law* will be the responsibility of the Fire Chief.

(2) Under the supervision of the Fire Chief, the Division Chief of Emergency Management will perform the duties of the Municipal Emergency Management Co-ordinator as outlined in the *Emergency Management By-law*.

RESPONSIBILITIES OF THE DIVISION CHIEF OF EMERGENCY MANAGEMENT

9. (1) The Division Chief of Emergency Management shall be appointed for such term as Council deems necessary.

(2) The Division Chief of Emergency Management shall:

(a) co-ordinate and prepare municipal emergency management plans, training, and exercises;

(b) be responsible for on-going public self-help education programs related to emergency preparedness;

(c) following activation of the municipal plan or a declaration of state of local emergency, prescribe, as necessary, duties to be fulfilled by designated employees, agents, and volunteer fire fighters of the Municipality;

(d) perform such other duties as may be required by the Fire Chief, the Chief Administrative Officer, or the Council; and

(e) serve as a member of the Municipal Emergency Planning Committee.

PART III
LOCAL ASSISTANTS TO THE FIRE MARSHAL

FIRE CHIEF

10. (1) Pursuant to Section 14 of the *Fire Safety Act*, the Fire Chief is appointed as a Local Assistant to the Fire Marshal within the Municipality.

(2) Within the Municipality, the Fire Chief may,

(a) establish a system of fire-safety inspections of land and premises situate within its jurisdiction, as required by the regulations, to provide for compliance with the *Fire Safety Act*, the regulations, and the Fire Code;

(b) approve other local assistants to the Fire Marshal and appoint municipal fire inspectors and investigators to carry out fire safety inspections and fire cause determination; and

(c) appoint a Division Chief of Fire Prevention to execute the responsibilities of Halifax Regional Fire & Emergency related to fire safety inspections, fire cause determination, public education, and Fire Code enforcement.

DUTIES OF THE DIVISION CHIEF OF FIRE PREVENTION

11. The duties of the Division Chief of Fire Prevention are as follows:

(a) to establish and conduct a system of inspections to provide for fire safety, assess the adequacy of fire-prevention measures, and ensure compliance with the *Fire Safety Act* and building regulations;

(b) to establish a system of record management and ensure that:

(i) a record is made of every inspection undertaken by the Fire Prevention Division,

(ii) such records are maintained and made available, upon request, to the Fire Marshal or a deputy fire marshal, and

(iii) unless otherwise prescribed by the regulations, such records are maintained for at least five years;

(c) to implement a system of on-site inspections by municipal fire inspectors of premises referred to in the *Fire Safety Act* and to ensure such records reflect the actual conditions at those premises;

(d) to immediately, and in no case later than twenty-four hours following a fire, investigate, or cause to be investigated, the cause, origin and circumstances of every fire by which property has been destroyed or damaged that occurs within the municipality;

(e) to notify the police immediately and the Fire Marshal within twenty-four hours if:

(i) the result of a fire has been the loss of human life, or

(ii) the local assistant or fire investigator investigating the fire believes that the fire is incendiary or of suspicious origin; and

(f) to assist the Fire Marshall in the delivering of public fire safety education programs and training as well as other emergency management public education and messaging.

PART IV
SERVICES PROVIDED BY HALIFAX REGIONAL FIRE & EMERGENCY

12. (1) Pursuant to section 304 of the *Halifax Regional Municipality Charter*, the Municipality may provide fire and emergency services including:

(a) Confined Space Rescue;
(b) Emergency Management;
(c) Fire Prevention & Public Education Fire Services;
(d) Firefighting and Fire Related Emergencies;
(e) Ground Search and Rescue;
(f) Hazardous Materials:
(g) Ice Rescue;
(h) Marine (Vessel) Firefighting;
(i) Medical Emergencies;

(j) Rope Rescue;
(k) Structural Collapse;
(l) Surface Water Rescue;
(m) Technical Rescue;
(n) Trench Rescue;
(o) Urban Search & Rescue;
(p) Vehicle Rescue; and
(q) Wildland Firefighting;

as defined in Schedule 1.

(2) Halifax Regional Fire & Emergency shall endeavor to provide services in the Municipality at the minimum service levels outlined in Table A.

Table A

	Category	**Service Type**	**Minimum Service Level[1]**
1.1	Firefighting	Structural	Offensive
1.2		Wildland	Ground Cover Fires
1.3		Marine (Vessel)	Defensive & Support
2.0	Emergency Medical	Medical First Response	Advanced Medical First Responder[2]
3.1	Technical Rescue	Vehicle Rescue	Technician Level[3]
3.2		Surface Water Rescue	Technician Level
3.3		Ice Rescue	Technician Level
3.4		Confined Space Rescue	Technician Level
3.5		Rope Rescue	Technician Level
3.6		Trench Rescue	Technician Level
3.7		Structural Collapse	Technician Level[3]
3.8		Urban Search & Rescue	Heavy[4]
4.0	Hazardous Materials	Hazardous Materials Response	Technician Level
5.0	Fire Prevention & Education	Fire Prevention & Education	Fire Code Inspections and Enforcement, Fire Cause Determination and Public Education
6.0	Emergency Management	Coordination of Municipal Emergencies	Emergency Planning, Preparedness and Response
7.0	Ground Search & Rescue		Assistance

[1] See Schedule 1 for Service Levels.

[2] HRFE will continue to partner with EHS and other medical agencies to enhance medical services.

[3] Achieving the Technician level of Vehicle Rescue, Building Collapse and Heavy Urban Search & Rescue is predicated on application into the Federal USAR program. This program allows cost sharing 25/75 Municipal/Federal for specialty training, equipment, backfill and deployment. Progress from current state to

[4] Heavy capability is anticipated over a minimum of a three-year period, with no significant impacts on the operating budget of HRFE.

PART V
TRANSITION

REPEAL
21. Administrative Order 24, the Halifax Regional Municipality Fire and Emergency Service Administrative Order is repealed.

Done and passed this day of , 201 .

Mayor

Municipal Clerk

SCHEDULE 1

FIRE AND EMERGENCY SERVICE LEVELS

1. In this Schedule,

(a) "ICs" means Incident Commanders;

(b) "JPR" means the job performance requirements;

(c) "NFPA" means the United States trade association that creates and maintains standards, codes, and industry best practices for training, equipment and qualifications for firefighting and associated rescue disciplines;

(d) a NFPA Standard sets the progressive skills and JPRs at the awareness, operations, and technician level; and

(e) a reference to a NFPA standard is a reference to the latest edition of that standard from the NFPA.

1.1 Firefighting and Fire Related Emergencies:

"Structural Firefighting" means the activities of rescue, fire suppression, and property conservation in buildings, enclosed structures, or like properties that are involved in a fire or emergency-situation.

Departments will have firefighters trained in protective personal equipment, down alarms, accountability system, adequate water supply, pumping capacity, incident command system, and who meet the NFPA Standard 1001.

At fires and fire related emergencies, responders generally employ either offensive or defensive actions in their efforts to save lives, protect property, and minimize impacts to the environment. ICs weigh many factors, including the stage of fire, fire location, structural integrity, available resources, water supply, and risk profile when declaring a strategy.

ICs may employ a transitional strategy which may change as conditions change, such as when conditions improve allowing offensive actions, or where conditions deteriorate requiring a change to defensive actions.

Offensive Structural Firefighting Strategies are intended to extinguish a fire and includes search, rescue, and fire attack conducted inside the structure. Such offensive strategies are appropriate where the risk of entering the building, or immediately dangerous environment is tolerable, and there is a high probability that doing so will save lives or property.

Defensive Structural Firefighting Strategies are intended to control a fire by limiting its spread to exposed structures and avoiding the commitment of personnel and equipment to dangerous areas. Such defensive strategies are conducted from the exterior of structures and are based on a determination that the risk to personnel exceeds the potential benefits of offensive actions.

1.2 "Wildland Firefighting" means firefighting of ground cover fires in combustible vegetation, such as grass, brush, and forest, as outlined in NFPA Standard 1001. It also includes procedures for protecting structures at the urban interface between wildland areas and residential structures.

Firefighters of Halifax Regional Fire & Emergency must be familiar with Department of Natural Resources ("DNR") firefighting procedures and equipment to assure interoperability for operations in areas of shared

jurisdiction or when providing support.

Public Education, in conjunction with property fire safety inspections, are proactive methods to increase public safety, and reduce the risk of wildland fires from damaging property and structures through fire prevention.

1.3 "Marine (Vessel) Firefighting" means the extinguishment of fires on ships and vessels, whether moored, secured to a dock, under construction, or in dry dock. Shipboard firefighting, if provided, must be carried out following the NFPA Standards 1405, *Guide for Land-Based Fire Fighters Who Respond to Marine Vessel Fires,* and NFPA 1005, *Standard for Professional Qualifications for Marine Fire Fighting for Land-Based Fire Fighters.* These standards identify the minimum skills, knowledge, training, and JPRs for marine fire fighting for land-based fire fighters.

Offensive Marine (Vessel) Firefighting is used when trained resources are adequate and the vessel is stable and tenable for below deck shipboard firefighting operations. The IC may choose from a range of strategies, including aggressive handline attack, remote agent application, or smothering.

Defensive Marine (Vessel) Firefighting is used when trained resources are insufficient for below deck extinguishment, or where the danger to personnel, environment, or exposures outweighs other considerations. The IC's may choose from a range of strategies, including containment and exposure protection, to the removal of the vessel to an appropriate location.

Support for Marine (Vessel) Firefighting is used when members are trained in accordance with NFPA 1005, Chapter 4, but do not directly participate in below deck fire extinguishment. Such training includes training in vessel construction, terminology, hazards, effects of movement, fire plans, suppression systems, connecting to a water supply, communications, and exposure protection. The Members so trained may support the fire attack, ventilation and dewatering operations and take measures to prevent the extension of the fire to adjacent structures and combustible exposures.

2.0 "Medical Emergencies" means an acute injury or illness that poses an immediate risk to a person's life or long-term health. Response to medical emergencies by first responders includes first aid, CPR skills and techniques for sustaining life, preventing further injuries, and caring for illnesses and injuries until the next level of medical care arrives.

"Advanced Medical First Responder Program" means advanced training in first aid, CPR, and the use of Automated External Defibrillation (AED). Such training provides professional first responders with the training and skills they need to respond to medical emergencies.

Advanced Medical First Responder Program is the minimum level of medical response that will be provided by HRFE firefighters.

3.0 "Technical Rescue" means the application of special knowledge, skills and equipment to safely resolve unique and/or complex rescue situations.

Technical Rescue services, if provided, will be carried out in accordance with NFPA Standard 1670, *Operations and Training for Technical Rescue Incidents.*

To meet the requirements at the technician level, members must achieve all the requirements of the awareness, operations, and technician level of the NFPA Standard.

Service at the operations level, must meet all the requirements for both awareness and operations level. Service at the technician level, must meet all the requirements of awareness, operations and the technician level.

3.1 **"Vehicle Rescue"** means the stabilization and removal of patients from any device for transporting persons, things, or material following an incident or accident.

Vehicle Rescues range from the use of basic hand tools and procedures, to heavy hydraulic extrication equipment and advanced techniques.

Awareness Level for Vehicle Rescue: Responders who do not have specialized equipment for extrication but can respond to motor vehicle accidents. They are trained to fend off traffic, request specialized resources, recognize hazards, initiate patient care, and establish site control and scene management.

Operations Level for Vehicle Rescue: Responders that are trained in the use of cribbing, hydraulic extrication equipment, air tools and patient stabilization equipment. Crews at the Operations Level can stabilize the vehicle, perform extrication, package the patient, and remove patients trapped in common passenger vehicles.

Technician Level for Vehicle Rescue: Responders equipped with cribbing, spreaders, cutters, rams, chains, and air bags, who are trained in advanced techniques to perform extrication involving multiple patients, including packaging, treatment, and removal of patients injured or trapped in large or heavy transportation vehicles.

3.2 **"Surface Water Rescue"** means search and rescue from rivers, lakes, and ponds, and includes body retrieval.

Operating at search and rescue incidents on the ocean or saltwater will be at the request of the JRCC (Joint Rescue Coordination Centre) under the authority of the Canadian Coast Guard.

Ropes and other similar equipment used for Surface Water Rescue must meet NFPA Standard 1983, *Fire Service Life Safety Rope and System Components*.

Awareness Level for Surface Water Rescue: Responder does not have the equipment or specialized training to perform a rescue but can recognize hazards, assess the situation, and assist a patient from the shore by reaching or throwing a rope or other device (Reach Rescue). If unable to assist, the Responder will maintain visual sight of the patient, request additional resources, and initiate site control and scene management.

Operations Level for Surface Water Rescue: Responder can size-up and ensure responder safety when conducting shore-based rescue operations or surface water-based search and rescue operations from a watercraft. Members must use an approved personal flotation device (PFDs) for each rescuer and be able to throw ropes or life ring with rope (Throw Rescue). Training must include boating safety.

Technician Level for Surface Water Rescue: Responders can plan and conduct both boat assisted and boat based search and rescue operations. Rescuers may enter the water and use survival suits, water rescue equipment appropriate for conditions, a boat, and a PFD's (Go Rescue).

3.3 **"Ice Rescue"** means a water rescue, except in conditions of cold-water, ice or freezing conditions.

Ropes and other similar equipment used for an Ice Rescue must meet NFPA Standard 1983, Fire *Service Life Safety Rope and System Components.*

Awareness Level for Ice Rescue: Crews can respond, but do not have the equipment or specialized training. They can use reach techniques to assist a patient, assess the situation, request additional resources, recognize hazards, and initiate site control and scene management (Reach Rescue).

Operations Level for Ice Rescue: Responders are trained to perform rescue techniques from the ice and shore based cold-water rescues. Members can recognize unique hazards, ice characteristics, and signs of hypothermia. Members must use approved PFDs for each rescuer, and be able to use surface equipment, throwropes, stretcher and life ring with rope (Throw rescue).

Technician Level for Ice Rescue: Members are trained to coordinate and perform multiple rescue techniques on ice, enter cold-water, and boat based search and rescue operations. Members use full ice rescue kit, including floatation suits, boats, and ice rescue board or equivalent (Go Rescue).

3.4 **"Confined Space Rescue"** means teams trained and equipped to enter, search, and rescue individuals from a fully or partially enclosed space that is not designed or constructed for continuous human occupancy, and may pose a physical or atmospheric hazard due to its construction, location, contents, or work that is done in it.

Awareness Level for Confined Space Rescue: Responders at the awareness level are trained to recognize the hazards associated with a confined space, can initiate site control and scene management, and will call for appropriately trained resources. Members of a team are not rescuers, but can perform certain non-entry retrievals. They must be trained in Hazardous Materials.

Operations Level for Confined Space Rescue: Operating in teams of no less than four persons, crews can use specialized equipment and are trained in the basic techniques necessary to effectively support and take part in a technical confined space rescue or retrieval. Competency involves search, rescue and recovery in permit-required confined spaces, but duties are generally carried out under the supervision of a "Technical Level" team member. Team members at this level will be trained in basic trench rescue and rope rescue techniques.

Technician Level for Confined Space Rescue: Responding at the technician level requires no less than six members who are trained and equipped to perform search and rescue in a permit-required confined space. Teams must be able to continuously monitor and evaluate the existing and potential conditions within the confined space and rescue site, ensure medical surveillance, use control procedures such as lock-out, tag-out, and develop and implement entry and safety plans.

3.5 **"Rope Rescue"** means the rescue of persons at height from buildings, cliffs, trees, or slopes where individuals must be lowered or raised by rescuers.

Equipment and ropes used for Rope Rescues must meet NFPA 1983. Firefighters must be trained and equipped with gloves and protective clothing appropriate for the incident.

Awareness Level for Rope Rescue: Crews operating must be able to recognize the hazards and initiate site control and scene management. They may secure and stabilize accessible patients using lifelines if equipment is available, and will call for appropriately trained resources.

Operations Level for Rope Rescue: Members trained and equipped to perform basic rescue techniques using ropes, equipment, and systems to move a patient and rescuer to a stable location in both the high angle and low angle (slope) environment.

Technician Level for Rope Rescue: Operating in teams, rescuers can ascend and rappel on a rope to assess a patient, perform a rescue of a suspended patient, package and provide care for injured patients using spinal immobile devices and litter baskets, utilize mechanical advantage systems, and move a litter basket along a vertical or horizontal rope system.

3.6 **"Trench Rescue"** means a specialized form of Confined Space Rescue that involves shoring up the sides of a trench and digging out a trapped patient from under dirt, gravel, or material that has collapsed into a ditch, hopper, or excavation.

Awareness Level for Trench Rescue: Responders can recognize the hazards associated with a Trench Rescue and initiate site control and scene management. Crews may initiate non-entry excavation of non-injured or minimally injured patients utilizing available resources and hand tools. Members must be trained at the Awareness Level in a Confined Space Rescue.

Operations Level for Trench Rescue: Members can size up, identify probable patient locations, monitor air quality, and stabilize the edge of the trench before making entry into a trench or excavation. Members are trained and equipped to use wood shoring and specialized equipment to locate and remove patients from simple excavations of not more than 8 feet deep. Members must be trained to the Operations Levels of Rope Rescue, Confined Space, and Vehicle/Machinery Rescue.

Technician Level for Trench Rescue: Members can use wood shoring, trench boxes, air bags and specialized pneumatic shoring equipment in single or intersecting trenches or excavations of depths more than 8 feet. Members must be trained to the Technician Levels of Confined Space and Vehicle/Machinery Rescue. Members must be competent in the use of atmospheric monitoring equipment, and the stabilization of any below grade utilities.

3.7 **"Structural Collapse"** means the capability to rescue of persons from collapsed structures or buildings and is a highly specialized rescue service that requires breadth of knowledge across multiple disciplines. It is closely linked to the Federal Urban Search and Rescue Program. (USAR).

Awareness Level for Structure Collapse: This level represents the minimum level of capability required for organizations that respond to technical search and rescue incidents. It includes recognizing the hazards, initiating a response system, types of collapse, search markings, site control, scene management, and techniques for removing accessible patients. In addition to structural collapse awareness training, members must be trained at the Awareness Level for Confined Space Rescue.

Operations Level for Structure Collapse: The capability of an organization to respond to technical search and rescue incidents, size-up conditions, identify hazards, use specialized equipment, and apply limited rescue techniques for ordinary construction and unreinforced masonry. In addition to structural collapse training, members must be trained at the Operations Levels for Confined Space, Rope Rescue, Trench, and Vehicle/machinery as well as the Awareness Level for Water Rescue.

Technician Level for Structure Collapse: The capability of an organization to respond to search and rescue incidents, use specialized equipment, apply advanced techniques, stabilize the structure and safely remove trapped patients from inside and beneath collapsed structures of all types. In addition to appropriate structural collapse training, organizations must train at the technician level in Confined Space, Rope Rescue, Trench, Vehicle/machinery and awareness level for water rescue.

3.8 **"Urban Search & Rescue"** means the multi-disciplined technical search and rescue skills provided by responders in the event of a disaster. These specialized skills play a critical role to safely search, locate and rescue patients trapped in urban buildings that are damaged or have collapsed.

The Public Safety USAR Program closely follows the NFPA 1670 Standard on *Operations and Training for Technical Search and Rescue Incidents,* and the Structural Collapse requirements outlined in Section 3.7. Public Safety Canada(PSC) has published the *Canadian Urban Search and Rescue Classification Guide,* which defines the level of capability, standard array of tools, equipment and supplies suitable for teams at Light (LUSAR), Medium (MUSAR) and Heavy (HUSAR) operational levels. This continuum from light to heavy is based on factors including mobility, sustainment, length of operating period, logistics and enablers such as medical, engineering, communications and canine search. This capability is activated through Municipal and Provincial EMO's to PSC.

LUSAR Teams must be able to operate for up to 12 hours, responding within their jurisdiction. They must be able to rescue and treat patients with moderate or minor injuries using simple hand tools and wood shoring techniques from surface collapse of ordinary construction and unreinforced masonry.

MUSAR Teams must be able to operate for up to 24 hours within their municipal boundaries. They must be able to rescue and treat 1-2 critical, 5 moderate and 10 minimally injured patients from collapsed and failed structures, including heavy timber, reinforced masonry, and steel frame construction. They use specialized equipment and shoring techniques (Building Collapse Operations Level).

HUSAR Task Force is a group of specialized rescue teams that are integrated into a task force with resources that include search, medical, and structural assessment capacity. HUSAR Task Forces locate trapped persons in collapsed structures of all types using specially trained dogs and electronic search equipment. They must be able to operate for up to 10 days and be self-sufficient for at least 3. Rescue teams can breach, shore, lift, and remove structural components, use heavy construction equipment to remove debris, and medically treat and transfer patients. The main elements of HUSAR are focused on Task Force interoperability, as well as 24/7 operational readiness to deploy on short notice in response to domestic incidents.

4.0 "Hazardous Materials" means the release of a substance that when released can cause harm to people, the environment, or property.

Response to incidents that involve Hazardous Materials range from oil spills, up to and including toxic chemical releases.

Training and equipment for response to Hazardous Material incidents must be in accordance with NFPA Standard 472, *Professional Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*.

Awareness Level for Hazardous Material: Responders who, during their normal duties, could be the first on the scene of an emergency involving Hazardous Materials. First responders must be able to respond in a defensive fashion, recognize the presence of hazardous materials, protect themselves from exposure, secure the area, initiate preventative actions as described within the Emergency Response Guidebook (ERG), and call for trained personnel.

Operations Level for Hazardous Material: Responders who initially respond in a defensive fashion, identify the product, predict its behavior, and establish emergency decontamination. If mitigating the spill is within the scope of their training, resources, and PPE, members may rescue viable patients and control the release, or keep it from spreading. Members must not be used for entry into immediately dangerous to life and health (IDLH) environments.

Technician Level for Hazardous Material: Hazardous materials technicians are expected to collect and interpret response information, develop a response plan, establish decontamination procedures, and implement appropriate safety measures. They must be able to don, work in, and doff both splash and vapor-protective chemical clothing, use air monitoring equipment and specialized leak control tools and equipment. They respond to releases or potential releases of hazardous materials, don specialized PPE, enter IDLH environments, rescue viable patients and bring the leak under control.

5.0 Fire Prevention & Public Education- A primary goal of every fire department is to educate the public about fire safety and to take precautions to prevent potentially harmful fires. It is a proactive method to increasing public safety by reducing fire emergencies and the damage they cause.

Inspections: As local assistants for the Fire Marshall, fire inspectors establish a system of on-site

inspections and conduct fire safety inspections to ensure that land and premises referred to in the *Fire Safety Act* are in accordance with appropriate laws, codes, ordinances, regulations, and standards. These records will be kept for five years and reflect the actual conditions at those premises.

Code Enforcement: The main purpose of building codes is to protect public safety and general welfare as they relate to the construction and occupancy of buildings and structures. Fire inspectors ensure compliance with the *Fire Safety Act* and the regulations by issuing orders to the owner of premises, when they are in contravention with these regulations. These orders identify the contravention and may include, carrying out repairs or alterations, removing any combustible or explosive materials, repairing or replacing faulty fire-protection systems or addressing anything that poses a fire hazard or compromises fire safety.

Fire Investigations: Under the *Fire Safety Act*, the Municipality is responsible to investigate, or cause to be investigated, the cause, origin and circumstances of every fire by which property has been destroyed or damaged within the municipality. Fire investigators document, gather evidence, and determine the origin and cause of fires, as well as identifying the human actions that may have caused the fire.

Public Education: Fire Prevention Educators develop and deliver educational and informative fire prevention, injury reduction and life safety programs. They also develop fire safety messages and provide safety information to social media and local media to promote educational programs, services, and fire prevention activities.

6.0 Emergency Management: On behalf of the Municipality, the Fire Chief and the HRFE Emergency Management Coordinator(EMC) is responsible to ensure the coordinated response to emergencies and disasters within the Municipality. The EMC is responsible for emergency planning, preparedness, mitigation, response, and recovery.

Emergency Planning: Developing emergency plans is a critical activity to minimize the impacts of any emergency, by pre-planning emergency response, developing hazard specific strategies, assuring business continuity and accelerating the recovery after the emergency.

Emergency Preparedness: Educating the public on the importance of emergency preparedness and self-help programs like preparing a home emergency kit is critical to keeping the public safe and healthy during initial phases of an emergency. Preparedness may also include planning to evacuate your home, and monitoring emergency notifications if an evacuation order is given by authorities.

Emergency Response: Following activation of a municipal plan or a declaration of a state of local emergency, assuring a coordinated response to the emergency is a key responsibility of the EMC. They may prescribe as necessary, duties to be fulfilled by designated employees of the Municipality, agents, and volunteer firefighters for the staffing of an Emergency Operations Centre (EOC) or the formation of an Incident Management Team (IMT).

7.0 "Ground Search and Rescue" means a civilian ground search and rescue association that is equipped and trained, and can locate lost or injured persons that are missing in remote locations, in support of EMO-Nova Scotia. GSAR is activated through the HRFE Municipal Emergency Management Coordinator.

Assistance: Halifax Regional Fire & Emergency may assist HRP/RCMP and GSAR by providing initial resources to assist in the location and medical care of injured persons missing in remote locations within the Municipality. Other assistance available upon request, based on available resources.

Emergency Response Time Targets

For

Halifax Regional Fire & Emergency

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Introduction and Background

In February of 2006, Regional Council approved the recommended 'Service Delivery Standards for Halifax Regional Fire & Emergency' as the desired level of service for the delivery of fire and emergency services to the citizens of the Halifax Regional Municipality.

Halifax Regional Fire & Emergency (HRFE) engaged Pomax Consulting in March of 2015 to conduct an independent review of the Service Delivery Standards and Administrative Order 24 to identify performance gaps, and to make recommendations on service levels and response targets for HRFE that best meet the needs of the municipality. Pomax also conducted a Fire Dispatch Operational Review that recommended making several technological and process changes to ensure consistent and reliable data collection for performance measurement. After a detailed analysis of the 2006 Service Delivery Standard, Regional Council directed staff to return to Council with a revised Fire Service Delivery Standard and Administrative Order 24.

In January of 2017, HRFE received a "Fire Protection Services Study" from the Fire Underwriters Survey (OPTA Municipal Consulting Services) which includes recommendations relevant to Administrative Order 24 and HRFE service delivery targets.

In November 2018, HRFE received a final "Review of Administrative Order 24 and Halifax Fire and Emergency Service Delivery Levels Standards of Response – 2006" from Pomax Consulting Inc. This review also included recommendations relevant to HRFE service delivery targets and Administrative Order 24.

A critical factor in the effectiveness of any emergency response agency is the ability to get properly trained personnel and the appropriate equipment to the scene of an emergency incident in a timely manner. The recommendations from the FUS Study, Pomax Review and the NFPA 1700 series standards provided the framework for the proposed emergency response time targets, with logical deviations considering the diversity of fire protection districts serviced by HRFE.

NFPA 1710, Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (NFPA 1710 - 2016), and NFPA 1720 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments (NFPA 1720 - 2014), provide standard response criteria and expectations for the timely deployment of fire service staff to fire and emergency medical services incidents.

While not mandatory, the NFPA standards define specific benchmark times for Public Safety Answering Points (PSAPs) and fire/EMS communication centers to process and dispatch calls for emergency assistance, and for fire department Emergency Response Units (ERUs) to respond with appropriate resources in a specified time to mitigate emergency incidents. The key to successful mitigation of emergencies is based on a combination of factors including Dispatch, Turnout, and

Travel times (defined later). Several factors need to be considered when establishing service levels, including risk to life and property, hazards and population demographics.

Definitions

Dispatch Time: The time interval that begins when an alarm is received at the public sector answering point and ends when the response information begins to be transmitted via voice or electronic means to the emergency response facility or emergency response units in the field.

Turnout Time: The time interval from the receipt of the call notification by the station(s) or apparatus, until the time the apparatus notifies the Dispatch Centre that they are enroute to the call.

Travel Time: The time interval from when the apparatus notifies Dispatch that they are enroute to a call, until the time the apparatus notifies Dispatch that they are on scene at the call location, when vehicles are operated at a safe operating speed as defined by policy.

Response Time: The time interval that begins when an alarm is received at the public sector answering point and ends when the apparatus notifies the Dispatch Center that they are on scene of the emergency incident.

Station Coverage Area: The geographic area that can be covered from an identified station location within a specific time interval.

Fire Protection District: The geographic boundary of a defined area which is primarily serviced by a specific fire station.

Additional definitions are included in Appendix “A” of this document.

Methodology

Acceptable Exemption: The times for response as indicated in this service target (standard) will not apply to island properties which are not accessible by public roadway, private roads, or properties accessed through travel over privately owned bridges. In those situations, the actual response times will be deemed to be acceptable under the requirements of the Service Delivery Standard, and will be excluded from the annual calculations.

Extraordinary Exemption: Not withstanding any other provisions of this Service Delivery Target (Standard), to deal with any natural disasters or other similar conditions, or in the event a State of Emergency has been invoked, the Service Delivery Standard does not apply. Responses under these conditions will be excluded from the annual calculations.

Data Gathering and Analysis:

The NFPA 1700 series standards are based on either a fire service that is primarily volunteer (NFPA 1720), or a fire service that is primarily career (NFPA 1710). The proposed standard for HRFE is essentially a hybrid of the two NFPA 1700 series Standards, accounting for the diversity of the communities that are served by HRFE throughout the municipality.

A rigorous analysis of previously completed studies including the Pomax Reports, Fire Underwriter's Study and the Fire and Dispatch Operational Reviews was conducted. A comparative jurisdictional scan of fire departments of similar-sized communities across Canada was also performed to examine industry standards and best practices. The results from this analysis was a key component in the development of the proposed response time targets.

Population data was derived from Stats Canada current estimated population density per square kilometer from calculated civic address population.

The recommended emergency response time targets align with HRFE's commitment to advancing Council's priority outcome of Healthy, Livable Communities and will be reported annually by HRFE.

Emergency Response Time Targets

Dispatch Time (All Fire Protection Districts)

HRFE will establish a target which will see a Dispatch Time of 90 seconds, 90% of the time, for structure fires and emergency medical calls for all fire protection districts. A 90 second Dispatch Time would be in accordance with Pomax recommendation.

Turnout Time (Fire Protection Districts with population exceeding 100 persons per sq.km)

HRFE will establish a Turnout Time target for response to structure fire calls of 90 seconds, 90% of the time for Fire Protection Districts 2 to 18 and 58 (Core), for career staff. For Emergency Medical Services (EMS) calls, HRFE will establish a Turnout Time target of 60 seconds, 90% of the time.

NFPA 1720 (Volunteer) does not specify a turnout time for volunteer firefighters. HRFE will establish a Turnout Time target for response to structure fire calls of six (6) minutes, 90% of the time for Fire Protection Districts 2 to 18 and 58 (Core), when the response is by volunteer members. The Turnout Time criteria for career staff will apply to volunteer members when providing coverage and responding from the Station.

The NFPA 1710 (Career) turnout standard is based on the ideal situations of apparatus access and firefighter readiness to respond. Several variables impact turnout times, including fire station design, firefighter activity prior to alarm notification, and departmental policies and procedures for donning personal protective gear for firefighter safety prior to response.

Based on these considerations, the turnout standard for structure fires of 90 seconds, 90% of the time will be phased in over a three-year period.

Travel Time (Fire Protection Districts with population exceeding 100 persons per sq.km)

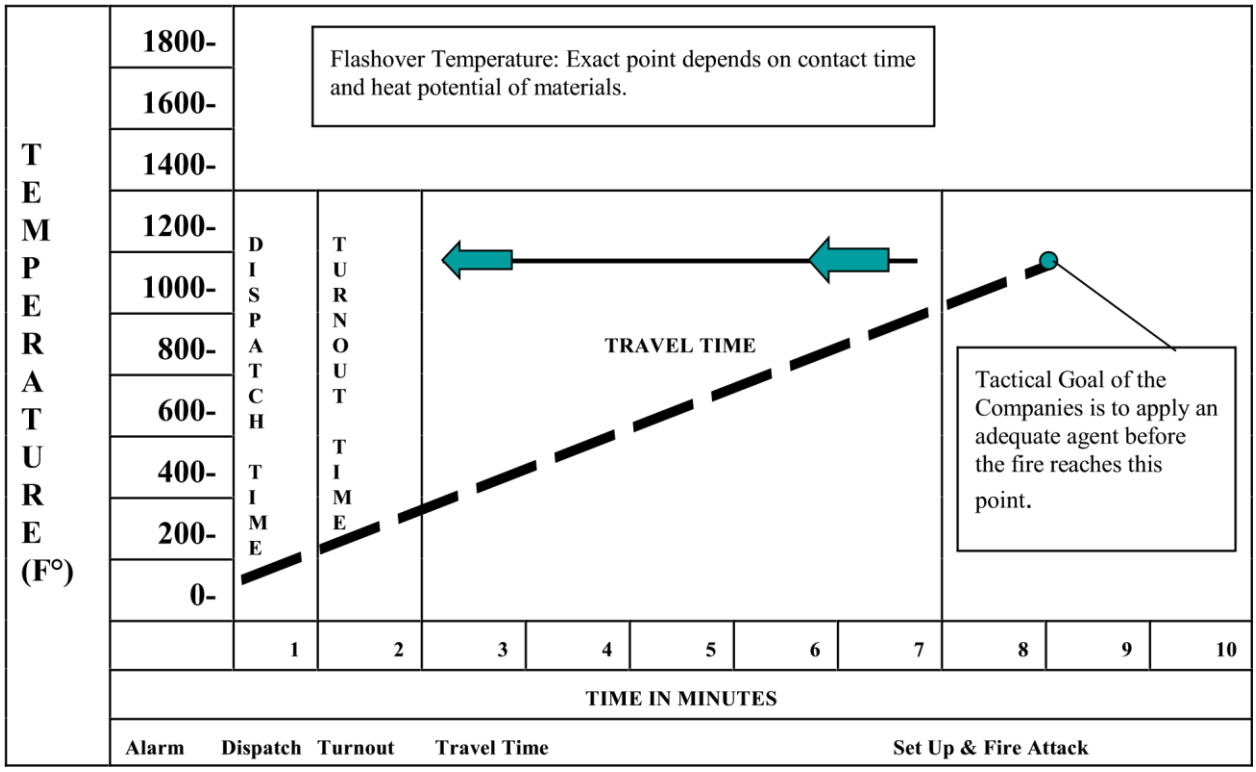
Both NFPA 1710 and NFPA 1720 recommend travel times specific to structure fires and EMS. HRFE will adopt this recommendation and establish a target for travel times to structure fire calls and the provision of emergency medical services, rather than all emergencies.

Pomax Consultant recommended continuation of a travel time target as established in the 2006 Standard.

The International City Manager's Association (ICMA) endorses the concept that fire stations should be strategically located throughout the city, which would enable the first-arriving apparatus to reach a structure fire and apply water before flashover. Flashover is typically considered to occur when the room temperature reaches 1100 °F. It is considered relevant because that is the point at which an unprotected person in that room would not be expected to survive.

The ICMA uses the fire growth characteristics of a residential fire. It is recognized that physical conditions in a residential occupancy (low ceiling heights, relatively small compartments, extensive combustible fuel loadings, etc.), all contribute to an extremely fast-developing fire that will cause a rapid flashover condition. The ICMA's recommended travel time is derived from the time-to-flashover being approximately 8-10 minutes for residential occupancies. Recent data indicates that the time to flashover in residential occupancies may even be quicker due to construction materials and peoples' tendency to incorporate more and more highly combustible materials into their homes.

Time Versus Products of Combustion



It is recommended that the Travel Time target criteria of five (5) minutes, 90% of the time, for the arrival of the initial apparatus be adopted by HRFE for response to structure fires and emergency medical service calls, when the response is by career or volunteer members.

When responding to structure fire calls, HRFE will achieve a 1st Alarm Assignment of 14 firefighters within eight (8) minutes, 90% of the time. Pomax recommended continuing with the 2006 target of 12 firefighters. NFPA 1710 recommends 15 firefighters (with an Aerial) for a single facility home.

The 1st Alarm Assignment adopted by HRFE consists of: three Engine crews (12 firefighters each), one Aerial (2 firefighters), one Tactical Unit (2 firefighters), one Command Chief (1 Officer), and one Safety Officer (1 Officer).

This travel time target would be applicable to areas of the HRM with a population density of over 100 persons per square kilometer. Currently this would encompass most of the Core, except for Station #11 fire response area (based on current estimated population density per square kilometer from calculated civic address population).

Turnout Time (Fire Protection Districts with population under 100 persons per sq.km)

NFPA 1720 (Volunteer) does not specify a turnout time for volunteer firefighters. The 2006 Standard indicates that turnout time for volunteers in rural districts will be six (6) minutes, 90% of the time. This Turnout Time is also supported by Pomax.

HRFE will establish a Turnout Time target of six (6) minutes, 90% of the time for Stations 19 to 63 (Rural), when the response is by volunteer members. When the response is by career members, HRFE will establish a Turnout Time target of 90 seconds, 90% of the time for structure fire calls, and 60 seconds for emergency medical services calls.

Note: Although Station 45 has a population density that exceeds 100 persons per square kilometer, this Station is currently included in the rural response protocol.

Travel Time (Fire Protection Districts with population under 100 persons per sq.km)

NFPA 1720 (Volunteer) describes response time criteria and numbers of firefighters depending on population density. This definition is a combination of both turnout and travel times. Travel time as adopted by HRFE is described as the time interval from when the apparatus notifies Dispatch that they are enroute to a call, until the time the apparatus notifies Dispatch that they are on scene at the call location.

Pomax and the 2006 Standard recommends a Travel Time target of ten (10) minutes, 90% of the time. HRFE recommends adopting this Travel Time Target for the first arriving apparatus for fire protection districts that have a population density of under 100 persons per square kilometer.

Future Considerations

HRFE has several demographic and geographical challenges that require constant evaluation to ensure service delivery response targets are sufficient to address changes in infrastructure and population densities. As population density increases in a fire protection district, a review of the service level in the fire protection district will occur. This review must consider the industrial and commercial base of the community, as well as facilities such as schools, hospitals, homes for special-care and seniors complexes, etc.

In future, fire protection districts may be designated as Urban or Rural based upon shifts in population density or other community risk factors.

Summary of Recommended HRFE Emergency Response Time Targets

This chart summarizes the recommended response time targets for HRFE's response to structure fire emergencies and medical emergencies. Our goal is to respond within these time targets, 90% of the time. The time targets are expressed in seconds. Urban fire response districts include those with a population of 100 persons per square kilometer or more. A comparison of the proposed targets to other comparators is provided for reference.

		HRM 2006	NFPA 1710	NFPA 1720	Pomax	Proposed HRM 2018
Dispatch Time Time from receipt of alarm to notification of Firefighters.	Structure Fires and Medical Emergencies	60	64	64	90	90
Turnout Time Time from notification to the start of travel to the emergency scene with fire apparatus.	**Structure Fire Emergencies**					
	Urban Career	60	80	90	90[1]	90
	Urban Volunteer	--	--	--	--	360
	Rural Career	60	80	90	90[1]	90
	Rural Volunteer	360	--	--	360	360
	Medical Emergencies					
	Urban Career	60	60	60	90[1]	60
	Urban Volunteer	--	--	--	--	360
	Rural Career	60	60	60	60	60
	Rural Volunteer	360	--	--	360	360
Travel Time Time from start of travel of fire apparatus to arrival at the emergency scene.	Urban Career	300	240	--	300	300
	Urban Volunteer	300	--	--	300	300
	Rural Career	600	240	--	600	600
	Rural Volunteer	600	--	--	600	600
1st Alarm	Urban Career	480[2]	480[3]	N/A	480[2]	480[4]

[1] To be phased in over 3 years.
[2] Total of 12 Firefighters.
[3] Total of 15 Firefighters (single family home including aerial operations)
[4] Total of 14 Firefighters.
-- denotes item not specified.

Moving toward these targets will require enhanced data collection and reporting, improved collaboration with Integrated Emergency Services (Dispatch), and ongoing training and education of firefighters and other staff. This process will span multiple years. As response time data becomes more reliable and available, staff may identify future opportunities for improvement that would be included in ongoing business planning.

Appendix “A”

Definitions:

Alarm Handling Time: The point of receipt of the emergency alarm at the Public Safety Answering Point, to the point where sufficient information is known to the Dispatcher to deploy applicable units to the emergency.

Command Officer: A member whose responsibility is to assume command through a formalized transfer of command process, and to allow company officers to directly supervise personnel assigned to them.

Company Officer: A supervisor of a crew/company of personnel.

Emergency Operations: Activities of the fire department relating to rescue, fire suppression, emergency medical care, and special operations, including response to the scene of the incident and all functions performed at the scene.

Fire Apparatus: A fire department emergency vehicle used for rescue, fire suppression or other specialized functions. Also referred to as an Emergency Response Unit (ERU).

1st Alarm Assignment: The total compliment of personnel, equipment and resources dispatched upon notification of a structural fire.

Initial Attack: Firefighting efforts and activities that occur in the time increment between the arrival of the fire department on the scene of a fire, and the tactical decision by the Incident Commander that the resources dispatched on the original response will be insufficient to control and extinguish the fire, or that the fire is extinguished.

Public Service Answering Points (PSAP): Any facility where 911 calls are answered, either directly or through rerouting.

Structural Firefighting: The activities of rescue, fire suppression, and property conservation in buildings, enclosed structures or like properties that are involved in a fire.

Re: Item No. 3

9.1.6

HALIFAX
REGIONAL MUNICIPALITY

Halifax Regional Council
February 14, 2006

TO: Mayor Kelly and Members of Halifax Regional Council

SUBMITTED BY: Original Signed
Dan English, Chief Administrative Officer

Original Signed
Wayne Anstey, Acting Deputy Chief Administrative Officer

DATE: February 06, 2006

SUBJECT: **Halifax Regional Fire and Emergency Service Delivery Levels - Standard of Response**

ORIGIN

Fire Services staff have been researching fire service standards since 2001 and on December 13, 2005 during the Council Focus Area presentation for Public Safety, Fire and Emergency Services Chief Eddy indicated he would provide Council with a strategy for the adoption of a service standard for Halifax Regional Municipality.

In addition, at a Regular Council Meeting of March 25, 2003, Councillor Johns requested a staff report on the closure and removal of staff from Station 11, Patton Road Fire Station, Upper Sackville. In discussions with the Councillor, staff advised that the Fire Service were developing a Service Delivery Standard that will address response and resource allocation for all HRM Fire Service.

RECOMMENDATIONS

It is recommended that:

1) Council accept the document "Service Delivery Standards for Halifax Regional Fire and Emergency Service" attached to this report as the desired level of service to be implemented over a multi-year period for the delivery of fire and emergency services to the citizens of the Halifax Regional Municipality by Halifax Regional Fire and Emergency Service.

2) Staff develop a multi-year response strategy for implementation as outlined in this Council report and in accordance with the Business Planning and Budget cycles.

Recommendations Continued on Page 2

3) Council establish the actual service standard for the delivery of fire and emergency services to the citizens of the Halifax Regional Municipality by Halifax Regional Fire and Emergency Service during the balance of the fiscal year 2005-06 at 70% of the desired standard set out in the document "Service Delivery Standards for Halifax Regional Fire and Emergency Service" attached to this report.

BACKGROUND

In 2001, the Chief Director requested an internal committee of fire service managers to review two new service delivery models (one for Career Stations - 1710 & one for Volunteer Stations - 1720), from the National Fire Protection Association (N.F.P.A.). The Committee was tasked to compare our current response criteria to other similar size cities, and how the Halifax Regional Fire and Emergency could establish a minimum benchmark relating to a service delivery model specifically designed for the HRM (Core and Rural).

The key to successful mitigation of emergencies is based on a number of factors, three of the primary ones are: Dispatch, Turnout, and Response times. Several other factors also need to be considered when establishing service levels, including risk to life and property, hazards, and population demographics.

DISCUSSION

When researching and organizing a Halifax Regional Fire and Emergency Service Delivery Standard, the Chief Director allowed the committee the leeway to develop a reasonable and workable standard that did not solely have to be based on the NFPA 1700 series standards. The decision was made to develop recommendations for service levels based on the NFPA 1700 series standards with logical deviations taking into account the diversity of fire protection districts serviced by Halifax Regional Fire and Emergency.

Service level delivery standards proposed encompass the services outlined in **Halifax Regional Municipality Administrative Order 24, Respecting Fire and Emergency Service in Halifax Regional Municipality**. The service delivery standard also provides for an **Acceptable Exemption** when the standard does not apply such as island properties which are not accessible by public roadway, private roads, or properties accessed through travel over privately owned bridges. In these situations, actual response times will be used and will be deemed acceptable under the requirements of the Service Delivery Standard, and will be excluded from the annual calculations.

Also, the Service Delivery Standard provides for an **Extraordinary Exemption**, in order to deal with any natural disasters or other similar conditions, or in the event a State of Emergency has been invoked, the Service Delivery Standard does not apply. Responses under these conditions will be excluded from the annual calculations.

These standards as presented on December 13, 2005 during the Council Focus Areas for Public Safety will provide the Fire Service with a mechanism in which to measure its service delivery as well as provide a strategy to deal with the future growth of Halifax Regional Municipality.

The following outlines the Financial Implications if the full service standards were to be implemented immediately:

Fleet Impact: ***Core (Stations 2 - 18):*** Based on current numbers of apparatus and maintenance of the current fleet reserve there will be no change. This is based on a 20 year replacement schedule. Construction of additional stations will require additional apparatus and this would be based on future growth to meet the proposed delivery standard. ***Rural (Station 19-63)*** A fleet replacement schedule is currently being developed as part of an Overall Fleet Plan. Fleet consolidations will be considered if supporting consolidation of facilities occurs.

Facilities: Based on the adoption in principle of these service delivery standards by Council, HRM Fire & Emergency proposes to undertake a Station Location Study for the entire area serviced by HRM and will develop a station location plan based on the Service Delivery Standard. We presently have a Station Location Study for the urban area dated 1997 which needs to be revisited based upon the acceptance of this Standard due to population growth, proposed development (Regional Plan) and traffic issues. Implications of the interface between the rural and core areas have not been fully studied and may have impact on proposed new stations. This emphasizes the need for an overall study encompassing the entire area serviced by Halifax Regional Fire and Emergency, including those areas currently under contract to other municipalities.

Core (Stations 2 - 18) - the construction of a new fire station (Penhorn) will allow for the consolidation of 2 existing stations (King St. & Woodside). Projected growth between Clayton Park and Bedford will strain the ability to respond from the existing stations and may create the need to construct an additional station in this area. Development in the Morris/Russell Lake areas may have an impact on delivery in those areas which will be considered in the updating of the Station Location Study. We are also studying the need and feasibility of a marine side terminal and firefighting/rescue capability for Halifax Harbour.

Rural (Stations 19 - 63) - station consolidation will be considered based on future fire station location studies. Station locations will be based on these service standards as adopted by Council. Consolidation and future growth will be based on meeting these service level standards. This is dependent upon the financial resources included in future capital budgets.

Initially several facilities may require upgrades to allow for the placement of staff during weekday hours in stations identified as the hub of each response district, in accordance with the Regional Plan. This plan will be phased in over a period of time, as funding allows, in order to fill the identified gap of personnel resources for day-time responses.

Personnel

The full implementation of this service standard would require 81 additional firefighters. This does not include provisions for increase in complement based on the construction of additional stations due to population growth, urban growth, or integration of any Federal Firefighting forces.

Deployment would be in accordance with operational need to meet the goals of the Service Level Standard of four (4) Firefighters per Engine Company, two (2) Firefighters per Aerial Unit and two (2) Firefighters per Rescue Unit.

During this period, our goal is to place staff for day time response coverage in hub stations in the rural districts as identified through the Regional Plan, in order to align services to the Regional Plan. Volunteer turnout and recruitment will be considered when decisions are made to add staff or increase coverage in areas served by volunteer stations.

Because of the financial implications set out in this report, HRM cannot afford to fully implement the full service standard at one time. Therefore the recommendation is to accept the document "Service Delivery Standards for Halifax Regional Fire and Emergency Service" attached to this report as the desired level of service to be aspired to for the delivery of fire and emergency services to the citizens of the Halifax Regional Municipality by Halifax Regional Fire and Emergency Service. Following approval of the desired service level, staff will be requested to develop a multi-year response strategy for implementation in accordance with the Business Planning and Budget cycles. In the meantime, Council will be requested to adopted a more realistic interim standard based on the resources that the Halifax Regional Fire and Emergency Service actually has..

BUDGET IMPLICATIONS

On the approval in principle by Council a multi-year staffing & response plan will be implemented as identified in this report. The goal for the balance of the 2005-06 fiscal period will be an actual service standard for the delivery of fire and emergency services to the citizens of the Halifax Regional Municipality by Halifax Regional Fire and Emergency Service at 70% of the desired standard set out in the document "Service Delivery Standards for Halifax Regional Fire and Emergency Service" attached to this report. This will be a standard based upon the actual resources of Halifax Regional Fire and Emergency Service at the present time. In subsequent years there will be budgetary increases required dependent upon the rate at which Council decides to fully implement the desired standards. This will be determined as part of the Business Planning and Budgetary process.

FINANCIAL MANAGEMENT POLICIES / BUSINESS PLAN

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Capital and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Capital and Operating, as well as any relevant legislation.

REGIONAL PLANNING IMPLICATIONS

Fire & Emergency Service does have representation on the Regional Planning Committee. The purpose of our involvement is to be aware of all new developments and incorporate the projected population density and its impact on Fire Service delivery along with identifying potential future station locations.

ALTERNATIVES

1. To continue to operate without a Service Delivery Standard leaves the Municipality and its Directors open to litigation, fails to ensure that public expectations are met or understood, and does not conform to the Corporate Scorecard Themes.

2. To adopt the NFPA Standards 1710 and 1720 as written. This alternative would result in a significant changes in the number of personnel required to deliver our service and would have significant financial implications to the Municipality.

3. Develop a multi-year strategy based on the budget and business planning process of HRM. This is the recommended alternative.

ATTACHMENTS

1) Service Delivery Standards for Halifax Regional Fire and Emergency Service

Additional copies of this report, and information on its status, can be obtained by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

Report Prepared by: Roy Hollett, Deputy Chief Safety & Strategic Initiatives, 490-5036

Original Signed

Report Reviewed By:
Barb Palmeter, Financial Consultant, 490-7221

Original Signed

Approved by:
Michael E. Eddy, Chief Director, 490-4238

Service Delivery Standards

for

Halifax Regional

Fire and Emergency

November 22, 2005

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Introduction and Background

In 2001, the Chief Director requested an internal committee of Fire & Emergency Chief Officers to look at the current service levels within HRM, and compare them to similar municipalities in an attempt to benchmark and establish service levels for Halifax Regional Fire and Emergency. HRM does not have established service delivery standards for determining acceptable levels of emergency services provided by Halifax Regional Fire and Emergency.

Prior to the 1996 amalgamation of the current HRM, each municipal unit controlled its own Fire Service. This service was (and is today) made up of both career and volunteer Firefighters. In some cases, the two groups worked side by side, and in others, the two rarely interacted. Generally, the local Fire Department was controlled by each respective community, resulting in 38 individual Fire Departments in the current HRM area. These Departments developed and followed their own rules on how they would operate, but their goals were usually the same: arrive at the emergency with as many firefighters as possible. Without minium standards in place, there was no evaluation of the effectiveness or efficiency of the provision of the emergency service, which resulted in a lack of ability to measure anything other than losses related to fire.

The key to successful mitigation of emergencies is based on a combination of factors including Dispatch, Turnout, and Response times (defined later). Several factors need to be considered when establishing service levels, including risk to life and property, hazards and population demographics.

Several municipalities were contacted, and information was obtained electronically where available on the Internet. The service levels provided by these municipalities were compared with the current level of service provided within HRM, in order to establish benchmarks for analysis.

The research by the committee coincided with the international debate over two proposed NFPA (National Fire Protection Association) Standards, **NFPA 1710 'Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments'**, and **NFPA 1720 'Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments'**. These standards have since been adopted by the NFPA.

The Chief Director allowed the committee leeway to develop a workable standard, which did not necessarily have to be based on the NFPA 1700 series standards. The working group has looked at several adopted municipal models, the NFPA 1700 series standards, insurance standards and military standards for providing protection to non-military structures on military bases. The decision was made to develop recommendations for service levels based on the NFPA 1700 series standards, with logical deviations taking into account the diversity of fire protection districts serviced by Halifax Regional Fire and Emergency Service.

Definitions

Due to some confusion around terminology commonly used in Fire & Emergency, the following terms are defined to clarify time intervals and station coverage areas:

Dispatch Time: The point of receipt of the emergency alarm at the public safety answering point, to the point where sufficient information is known to the dispatcher and applicable units are notified of the emergency.

Turnout Time: The time interval from the receipt of the call notification by the station(s) or apparatus, until the time the apparatus notifies the Dispatch Centre that they are en route to the call.

Response Time: The time interval from when the apparatus notifies Dispatch that they are en route to a call, until the time the apparatus notifies Dispatch that they are on scene at the call location, when vehicles are operated at a safe operating speed as defined by policy.

Station Coverage Area: The geographic area that can be covered from an identified station location within a specific time interval.

Fire Response Districts: The geographic boundary of a defined area which is primarily serviced by a specific fire station.

Additional definitions are included in Appendix "A" of this document.

SERVICE DELIVERY OBJECTIVES FOR ALL EMERGENCIES

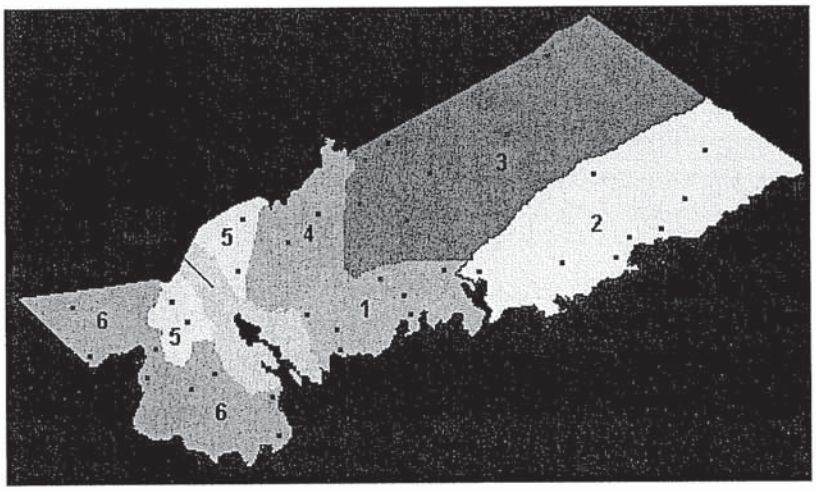
Service level delivery standards are proposed to encompass the services as outlined in Halifax Regional Municipality Administrative Order 24, Respecting Fire and Emergency Service in Halifax Regional Municipality. For a list of services, see Appendix "B" of this document.

Acceptable Exemption: The times for response as indicated in this standard will not apply to island properties which are not accessible by public roadway, private roads, or properties accessed through travel over privately owned bridges. In those situations, the actual response times will be used, will be deemed to be acceptable under the requirements of the Service Delivery Standard, and will be excluded from the annual calculations.

Extraordinary Exemption: Not withstanding any other provisions of this Service Delivery Standard, in order to deal with any natural disasters or other similar conditions, or in the event a State of Emergency has been invoked, the Service Delivery Standard does not apply. Responses under these conditions will be excluded from the annual calculations.

Data Gathering and Analysis:

Benchmark data comparison for response times was done with London, Ontario; Edmonton, Alberta; Indianapolis, Indiana; Vancouver, Washington.; and Kitchener, Ontario. The committee noted with interest that some of the municipalities listed above are currently working on a 5-year project to implement NFPA 1710. The issue in HRM is somewhat more complex, given that the NFPA 1700 series standards are based on either a fire service that is primarily volunteer (NFPA 1720), or a fire service that is primarily career (NFPA 1710). The proposed standard for HRM is essentially a hybrid of the two NFPA 1700 series Standards, accounting for the diversity of the communities that are served by Halifax Regional Fire and Emergency throughout the municipality.



*Red dots indicate Rural Fire Department locations.

Dispatch Time (All Fire Protection Districts)

Accurate verification of Dispatch Time will require implementation of the new CAD/RMS project. Manual verification of calls is the only process that can currently determine accurate Dispatch Time intervals.

Halifax Regional Fire and Emergency will establish a standard which will see a Dispatch Time of 60 seconds or less, 90% of the time, for all fire protection districts.

A one-minute (60 second) Dispatch Time would be in accordance with the NFPA 1710 recommendation, for fire protection districts with a population density of over 100 persons per square kilometer.

A one-minute (60 second) Dispatch Time would be in accordance with the NFPA 1720 recommendation, for fire protection districts with a population density under 100 persons per square kilometer. For structural incidents, this will include a minimum dual station response (Automatic-Aid).

Single unit or single station responses would occur for non-structural incidents through protocols developed by Halifax Regional Fire and Emergency, in consultation with the fire protection districts and other neighboring contract and Mutual Aid Fire Departments.

This Dispatch Time will be audited annually by Halifax Regional Fire and Emergency, in cooperation with 911 Fire Dispatch and an outside source, if required, at the discretion of the Chief Director of Halifax Regional Fire and Emergency. This audit will comply with the intent of the Corporate Scorecard theme of "Safe Communities."

Turnout Time (Fire Protection Districts with population exceeding 100 persons per sq.km)

Turnout Time is available for Stations 2 to 18 (Core). This was analyzed and compared to existing standards and times for other municipalities. It was felt that this data was significant to the areas protected by these stations.

Halifax Regional Fire and Emergency will establish a Turnout Time standard of one (1) minute or less, 90% of the time for Fire Protection Districts 2 to10 and 12 to 18 (Core). This time will be audited annually by Halifax Regional Fire and Emergency and an outside auditor, if deemed necessary by the Chief Director. This audit will comply with the intent of the Corporate Scorecard theme of "Safe Communities."

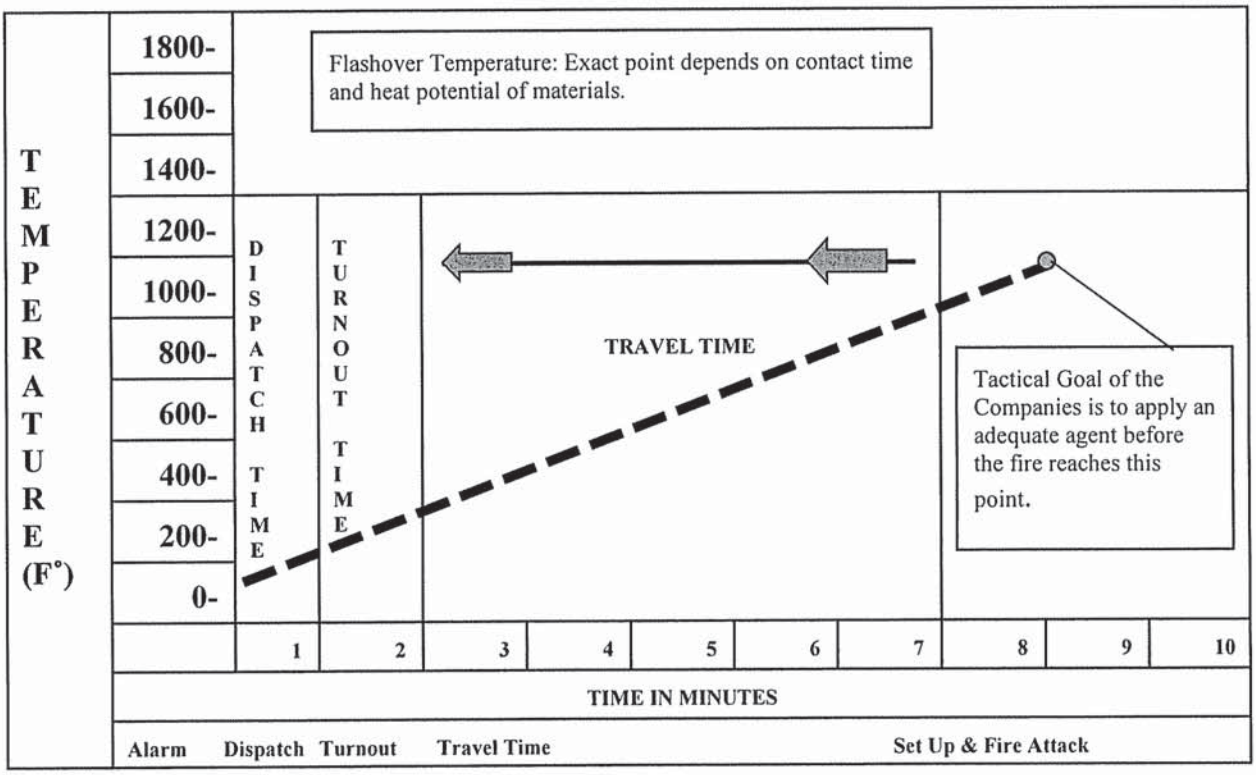
Response Time (Fire Protection Districts with population exceeding 100 persons per sq.km)

Sample data of response times was obtained for Stations 2-18 (Core) from the database currently available to Halifax Regional Fire and Emergency. The data was then analyzed for reporting and recording errors, and 15% of the data which was suspect was eliminated from the final analysis. The calls were then broken down by category, and whether or not the call was a single unit response (involving only one piece of fire apparatus), or a multiple unit response (involving more than one piece of fire apparatus). The details of this analysis were then plotted against the definition provided by the NFPA 1710 Standard. Varying times of response above the time recommended in the Standard were plotted to give an analysis that would allow an imperial value, in this case "time", which would show the gaps in service delivery dependent upon the standard selected. This material is supplied in a mapping format for ease of interpretation. This response data was based on response time being the time from which the fire apparatus departed the station, as recorded by Dispatch, to the time the unit actually arrived on scene.

The International City Manager's Association (ICMA) endorses the concept that in fire stations should be strategically located throughout the city, which would enable the first-arriving pumper to reach a structure fire and apply water before flashover. Flashover is typically considered to occur when the room temperature reaches 1100 °F. It is considered relevant because that is the point at which an unprotected person in that room would not be expected to survive.

The ICMA uses the fire growth characteristics of a residential fire. It is recognized that physical conditions in a residential occupancy (low ceiling heights, relatively small compartments, extensive combustible fuel loadings, etc.), all contribute to an extremely fast-developing fire that will cause a rapid flashover condition. The ICMA's recommended travel time is derived from the time-to-flashover being approximately 8-10 minutes for residential occupancies. Recent data indicates that the time to flashover in residential occupancies may even be quicker due to peoples' tendency to incorporate more and more highly combustible materials into their homes.

Time Versus Products of Combustion



It is recommended that the Response Time standard criteria of five (5) minutes or less, 90% of the time, for the arrival of the first arriving apparatus be adopted by Halifax Regional Fire and Emergency, regardless of the nature of the emergency service to be provided. It is recommended that the Response Time standard criteria of eight (8) minutes or less, 90% of the time, apply to the arrival of additional apparatus dispatched with the first arriving apparatus. For an upgraded alarm, it is recommended that the Response Time standard criteria of eight (8) minutes or less be adopted by Halifax Regional Fire and Emergency, to have a full first alarm assignment on scene 90% of the time. A full alarm assignment will be requested by the first arriving apparatus for structural incidents, or as deemed necessary.

Full Alarm Assignment in the Fire Protection Districts with population exceeding 100 persons per sq. km. will consist of two (2) Engines (1 Officer and 3 crew members each), one (1) Aerial Unit (2 crew members), one (1) Tactical Unit (2 crew members): Total 12 personnel. In addition to the operational personnel, an Incident Safety Officer and Chief Officer to act as a dedicated Incident Commander will also be dispatched.

This standard would be applicable to areas of the HRM with a population density of over 100 persons per square kilometer, and where there are career staff employed in that protection district. Currently this would encompass the majority of the Core, with the exception of Station #11 Fire

Response Area. (Based on estimated population density per square kilometer from calculated civic address population. To be reviewed with the next Stats Canada Population Survey, in conjunction with the Civic Address Population numbers from HRM GIS).

This "time" will be audited annually by Halifax Regional Fire and Emergency, and an outside auditor if deemed necessary by the Chief Director. This audit will comply with the intent of the Corporate Scorecard theme of "Safe Communities."

Turnout Time - Fire Protection Districts with population under 100 persons per sq.km)

Long term data is unavailable for Stations 19 to 63 (Rural: Composite/Volunteer) due to the lack of reliable data prior to the implementation of changes in Dispatch and the radio system. The future capability of verification of data for Stations 19 to 63 (Rural: Composite/Volunteer) has improved with the implementation of the CAD/RMS project.

Halifax Regional Fire and Emergency will establish a Turnout Time standard of six (6) minutes or less, 90% of the time for Stations 19 to 63 (Rural), when the response is by volunteer members.

Stations with career staff (Composite Stations) will meet the turnout time criteria of one minute or less, 90% of the time, when career staff are present.

This "time" will be audited annually by Halifax Regional Fire and Emergency and an outside auditor if deemed necessary by the Chief Director. This audit will comply with the intent of the Corporate Scorecard theme of "Safe Communities."

Response Time - Fire Protection Districts with population under 100 persons per sq.km)

Until the implementation of the proposed CAD/RMS project, there is limited reliable statistical reporting from Stations 19 - 63 (Rural/Composite).

It is recommended that the response standard criteria of ten (10) minutes or less for the arrival of the first arriving apparatus be adopted for fire protection districts that have a population density of under 100 persons per square kilometer. This would include all Rural/Composite Stations and Station 11.

This "time" will be audited annually by Halifax Regional Fire and Emergency, and an outside auditor if deemed necessary by the Chief Director. This audit will comply with the intent of the Corporate Scorecard theme of "Safe Communities."

It is further recommended that fire protection districts with a population density of over 25 persons per square kilometer, have daytime coverage with a minimum of 4 personnel on duty from 0700 to 1800 (these are the peak hours when the majority of responses are likely to occur - Monday to Friday where response by volunteers may be significantly delayed), unless the fire protection district can substantiate, through call records and verifiable data, that the community has adequate daytime coverage by Volunteers, to comply with the service standard for Fire Protection Districts with population under 100 persons per sq/km.

It is further recommended that fire protection districts with a low availability of volunteers during weekday daytime hours, (0700 to 1800) and with specific high occupancy risks (industry, schools, nursing homes, hospitals and seniors complexes), or with a lack of operational membership, consider staffing to a minimum of the above level.

In an effort to support recruitment and retention of volunteers, Halifax Regional Fire and Emergency have received an additional HR support staff member to deal with this North American trend of declining numbers of volunteers.

It is also recommended that when the population density in a fire protection district increases to 50 persons per square kilometer that a mandatory review of the service level in the fire protection district occur. This review must consider the industrial and commercial base of the community, as well as facilities such as schools, hospitals, homes for special care, seniors complexes, etc. The review must demonstrate that the staffing level is adequate, or that the volunteer turnout provides a satisfactory level of fire protection for the fire protection district. It may be appropriate in some communities to consider implementation of 24-hour coverage, with a minimum of four personnel, due to coverage and turnout issues.

Once a fire protection district has a population density that exceeds 90 persons per square kilometer, consideration should be given to future growth and development, in order to plan for the station to be able to provide response in accordance with the service standard, for fire protection districts with population density exceeding 100 persons per square kilometer.

Alternative staffing proposals for stations in close proximity to each other may result in a higher level of staffing responding from a single station, in order to provide a more efficient and effective level of service delivery. This should be considered if the service level delivery for the combined fire protection districts can be verified against the criteria, as addressed above.

Fleet:

Core (Stations 2 - 18): Based on current numbers of apparatus and maintenance of the current fleet reserve, there will be no change. This is based on a 20-year replacement schedule. Construction of additional stations will require additional apparatus, and this would be based on future growth to meet the proposed delivery standard.

Rural (Stations 19-63): A fleet replacement schedule is currently being developed as part of an Overall Fleet Plan, and will be followed based on adequate funding being provided through the Rural Tax Structure, to create a sufficient reserve to allow for fleet maintenance and replacement. Fleet consolidations will be considered if supporting consolidation of facilities occurs.

Facilities:

As part of this Service Standard, Halifax Regional Fire and Emergency proposes to undertake a Station Location Study for the entire area serviced by HRM, and will develop a Station Location Plan based on the Service Delivery Standard. We presently have a Station Location Study for the urban area dated 1997, which will be revisited based upon this Standard because of population growth, proposed development (Regional Plan) and traffic issues. Implications of the interface between the Rural and Core areas have not been fully studied, and may have an impact on proposed new stations. This emphasizes the need for an overall study encompassing the entire area serviced by Halifax Regional Fire and Emergency, including those areas currently under contract to other municipalities.

Core (Stations 2 - 18):

The construction of a new fire station (Penhorn) will allow for the consolidation of 2 existing stations (King St. & Woodside). Projected growth between Clayton Park and Bedford will strain the ability to respond from the existing stations and may create the need to construct an additional station in this area. Development in the Morris/Russell Lake areas may have an impact on delivery in those areas, which will be considered in the updating of the Station Location Study. We are also studying the need and feasibility of a marine-side terminal, and firefighting/rescue capability for Halifax Harbour.

Rural (Stations 19 - 63):

Station consolidation will be considered based on future fire station location studies. Station locations will be based on the service standard. Consolidation and future growth will be based on meeting these service level standards. Adequate financial resources will need to be included in future capital budget proposals.

Initially several facilities may require upgrades to allow for the placement of staff during weekday hours in stations identified as the hub of each response district, in accordance with the Regional Plan. This plan will be phased in over a period of time, as funding allows, in order to fill the identified gap of personnel resources for daytime responses.

Training Facilities:

The current training facilities utilized by Halifax Regional Fire and Emergency were constructed by the former City of Halifax in the mid-1980's to support 6 fire stations and approximately 220 members. No provisions were made for expansion, and the use of live fire training structures. This facility has a use as a primary training facility for pump operations, engineer driver training and aerial operational training, due to the exceptional water supply provided to the site. However, there

is a significant need for a fire training facility which will allow for year-round live fire, flashover and natural gas training, as well as CBRN (Chemical, Biological, Radiological, Nuclear), confined space, trench rescue, collapse rescue and high angle technical rescue training. If properly designed and funded, the facility could be utilized for vehicle extrication training, hazardous materials response training and could be used by other municipal departments for trench training, confined space training, natural gas and driver training. A Capital Reserve is proposed at $1,000,000 per year for 3 years, to provide a facility that will allow Halifax Regional Fire and Emergency members to maintain required levels of training. Federal Funding of $1,000,000 dollars is available on a cost-sharing basis from the Federal Joint Emergency Preparedness Program: Urban Search and Rescue Project for a training facility.

Personnel

Based on the implementation of this Service Standard, the current situation will require an increase in personnel complement. This does not include provisions for increase in complement based on the construction of additional stations due to population growth, urban growth, or integration of any Federal firefighting forces.

Future staffing increases will be phased in through the Business Planning process and available budget allocations.

Summary of Recommendations

A. For Fire Protection Districts with population density exceeding 100 persons per square kilometer.

1) A dispatch time of 60 seconds be established as a standard by HRM.

2) A turnout time of 60 seconds be established as a standard by HRM.

3) A response time of 5 minutes, or less - 90% of the time be established for single unit responses, or for the first arriving unit of a multiple unit response.

4) A response time of 8 minutes, or less - 90% of the time be established for subsequent arriving units of a multiple unit response or alarm assignment.

5) A full alarm assignment consists of 2 Engines, 1 Aerial, 1 Tactical Unit, for a total of 12 personnel.

6) An Incident Safety Officer and a dedicated Incident Commander will be dispatched on full alarm assignments, with no response time criteria.

7) A subsequent alarm assignment consists of a minimum of 2 units (configuration acceptable to the Incident Commander) for a total of 8 additional personnel.

B. For Fire Protection Districts with population density under 100 persons per square kilometer.

1) A dispatch time of 60 seconds be established as a standard by HRM.

2) Staff Turnout: A turnout time of 60 seconds be established as a standard by HRM.

Volunteer Turnout: A turnout time of 6 minutes or less - 90% of the time be established as a standard by HRM.

3) A response time of 10 minutes or less - 90% of the time be established as a standard by HRM.

C. Annual Auditing

Annual auditing is recommended for all service delivery standards. This will allow for confirmation of service levels and serve as a planning tool for future growth.

1) A population density of more than 25 persons per square kilometer will require a review, to determine the need for daytime coverage by career staff. Verifiable data of volunteer turnout to the standard during daytime hours, to meet the turnout and response criteria established as a standard by HRM.

2) A population density of more than 50 persons per square kilometer will require a review to determine the need for daytime coverage by career staff. This review must also consider infrastructure, industry and high occupancy risks. Verifiable data of volunteer turnout of sufficient numbers to provide protection services on a consistent basis must be provided, or consideration given to providing either daytime or 24-hour staff.

3) A population density of more than 90 persons per square kilometer will require a review to determine the need to plan for future growth and provision of services, once the population density exceeds 100 persons per square kilometer.

4) Alternative staffing proposals for stations in close proximity can be proposed/considered and implemented to provide more effective and efficient service delivery, provided the turnout and response criteria for each protection district can be met.

Appendix "A"

Definitions:

Alarm Time: The point of receipt of the emergency alarm at the public safety answering point, to the point where sufficient information is known to the Dispatcher to deploy applicable units to the emergency.

Apparatus: A motor-driven vehicle or group of vehicles designed and constructed for the purpose of fighting fires.

Company Officer: A supervisor of a crew/company of personnel.

Dispatch Time: The point of receipt of the emergency alarm at the public safety answering point, to the point where sufficient information is known to the Dispatcher and applicable units are notified of the emergency.

Emergency Operations: Activities of the fire department relating to rescue, fire suppression, emergency medical care, and special operations, including response to the scene of the incident and all functions performed at the scene.

Fire Apparatus: A fire department emergency vehicle used for rescue, fire suppression, or other specialized functions.

Initial Full Alarm Assignment: Those personnel, equipment, and resources ordinarily dispatched upon notification of a structural fire.

Initial Attack: Firefighting efforts and activities that occur in the time increment between the arrival of the fire department on the scene of a fire, and the tactical decision by the Incident Commander that the resources dispatched on the original response will be insufficient to control and extinguish the fire, or that the fire is extinguished.

Initial Rapid Intervention Crew (IRIC): Two members of the initial attack crew who are assigned for rapid deployment to rescue lost or trapped members.

Public Service Answering Points (PSAP): Any facility where 911 calls are answered, either directly or through rerouting.

Rapid Intervention Crew (RIC): A dedicated crew of firefighters who are assigned for rapid deployment to rescue lost or trapped members.

Rescue: Those activities directed at locating endangered persons at an emergency incident, removing those persons from danger, treating the injured, and providing for transport to an appropriate health

care facility.

Response Time: The time that begins when units are en route to the emergency incident, and ends when units arrive at the scene.

Structural Firefighting: The activities of rescue, fire suppression, and property conservation in buildings, enclosed structures, aircraft interiors, vehicles, vessels, aircraft, or like properties that are involved in a fire or emergency situation.

Supervisory Chief Officer: A member whose responsibility is to assume command through a formalized transfer of command process, and to allow company officers to directly supervise personnel assigned to them.

Sustained Attack: The activities of fire confinement, control, and extinguishment that are beyond those assigned to the initial responding companies.

Turnout Time: The time interval from the receipt of the call notification by the station(s) or apparatus, until the time the apparatus notifies the Dispatch Centre that they are en route to the call.

Appendix "B"

The Halifax Regional Fire and Emergency Service has committed to provide an emergency service to the following (In Accordance With: HALIFAX REGIONAL MUNICIPALITY ADMINISTRATIVE ORDER NUMBER 24 RESPECTING FIRE AND EMERGENCY SERVICE IN HALIFAX REGIONAL MUNICIPALITY)

Fire and Fire Related Emergencies:

Structural and Wildland:	Offensive and Defensive
Medical Response:	Medical First Responder
Vehicle Rescue:	Operational
Water Rescue:	Operational
Ice Rescue:	Operational
Structure Rescue:	Operational
Confined Space:	Operational
High Angle Rescue:	Operational
Hazardous Materials:	Operational
Search and Rescue:	Assistance (Ground Search & Rescue)
Fire Prevention/Education:	Inspections, Investigations, Public Education