

Fire Station Reports

The attached is the “Fire Station Reports” prepared by Opta Information Intelligence for Halifax Fire Services. Redacted sections indicate confidential or proprietary information.

STATION 2
5988 University Avenue

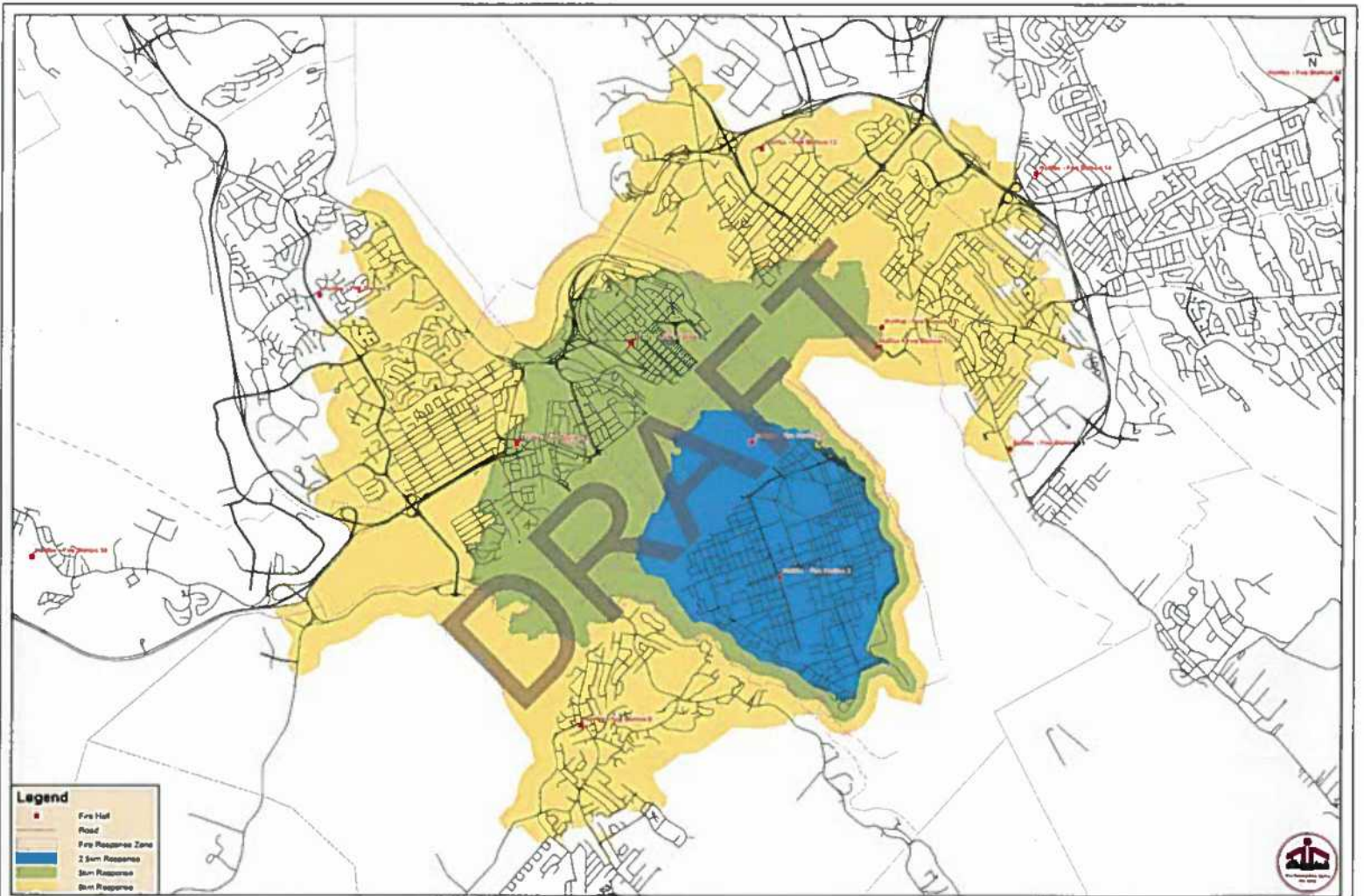


Station 2 is located in the Institutional area of Halifax on the corner of University Ave and Robie Streets. The station exits onto University Avenue at the corner of the Robie Street which has traffic lights for roadway entrance. The station is located in a fairly central position for response to its overall coverage area. Figure 1 shows the 2.5 km, 5 km and 8 km coverage from Station 2.

Building and Tarmac

All fire stations should be of substantial construction, suitable for the service, and located and arranged for ease and quickness of response. Fire Station 2 is constructed of concrete and steel framing with wood frame floors and roof. The roof construction is wood frame with built up asphalt. The tarmac is a concrete covered area which extends from the bay door to the street. The tarmac area is insufficient for vehicle run ups and day routines. Minor services require the apparatus to be moved to the centre of the street in the boulevard area in order to raise the cab for servicing.





Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The station has sleeping quarters that presently house five staff. These consist of Officer's quarters and an office with a washroom and shower across the hall from the quarters. Apparatus bays are located on the main level while the basement is used as a service area. The second floor provides office space, accommodation and a living area (day room). Accommodation for Officers at the station includes private sleeping quarters and an office area.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

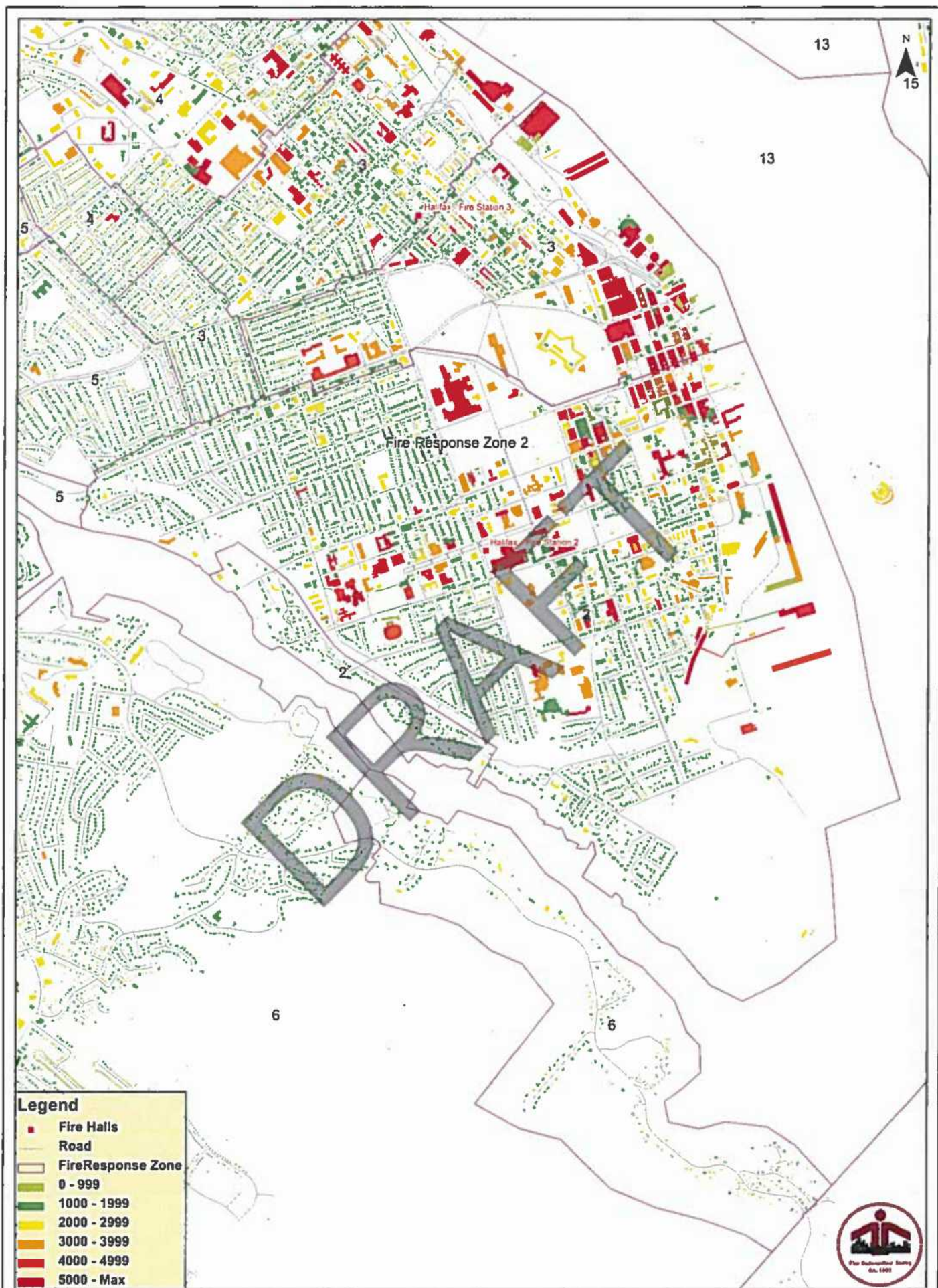
Community Risk Profile – Response Zone 2

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows (RFF). A total of 4,271 Required Fire Flows were calculated for Response Zone 2 as shown in Figure 2 below. Table 1 below shows the number of Required Fire Flows points for each calculated RFF range.

Table 1 Required Fire Flow ranges in Response Zone 2

RFF Range	No. of RFF points
0-999 IGPM	877
1,000-1,999 IGPM	3,095
2,000-2,999 IGPM	176
3,000-3,999 IGPM	61
4,000-4,999 IGPM	27
>=5,000 IGPM	35





In addition the Basic Fire Flow was determined for the response area. The Basic Fire Flow is usually calculated as the 95th percentile RFF value or the 5th highest RFF in the Fire Response Area. Considerations are given to the exposure risk, quantity of risks, and type of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response Zone 2 is based on the 5th highest which is 8,500 Imperial Gallons per Minute.

Table 2 Basic Fire Flows for HRM Response Zone 2

Total RFF Points	4,271	
	IGPM	L/s
90th Percentile	1,700	128.86
95th Percentile	2,300	174.34
Max	10,400	788.32
5th highest	8,500	644.3

Apparatus & Personnel

Standard staffing for Station 2 is a 4 person 24/7 shift. Apparatus assignment for Station 2 is a single class "A" pumper.

Station 2 was evaluated for the number of Engine and Ladder companies in service relative to the overall fire potential and the area being protected. Apparatus are required to be adequately housed and staffed. Fire apparatus that serve dual purposes are evaluated based on the primary duty it serves on the fire ground. Based on the Basic Fire Flow, the apparatus requirements defined in the Fire Underwriters Survey - Table of Effective Response is as follows:

- First due Pumper Company in 2.5 minutes.
- Second due Pumper Company in 3.5 minutes.
- First due Ladder Company in 2.5 minutes.

The benchmark number of apparatus required is 12 Pumper companies in 9 minutes and 4 Ladder companies in 9 minutes. These requirements reflect the apparatus need to attain maximum credit in the Engine and Ladder items of the fire department grading and serve as a benchmark against which response is measured. Ladders received 50 percent credit as Engine apparatus and 100 percent credit as



Ladder apparatus. Fire Station 2 received credit for 7.1 Engines out of the maximum 12 Engine companies that can be credited for grading.

Table 3 Credited in Service Engine Summary

Station #	Vehicle Type	Apparatus Credit	Engine Credit	Reserve Engine Credit
2	Engine	100% Engine Credit	1	0
3	Ladder	50% Engine Credit	0.50	0
3	Engine	100% Engine Credit	1	0
4	Engine	100% Engine Credit	1	0
5	Ladder	50% Engine Credit	0.50	0
13	Quint	50% Engine Credit	0.50	0
6	Engine	100% Engine Credit	1	0
12	Quint	46% Engine Credit	0.46	0
15	Engine	78% Engine Credit	0.78	0
7	Quint	39% Engine Credit	0.39	0
2	Ladder	50% Reserve Credit	0	0.5
2	Engine	100% Reserve Credit	0	1
Total Engine Credit:			7.1	1.5
Maximum Credit Receivable (8,500 lpgm):			12	1

Currently there is only one reserve Ladder stationed at Station 2. Response areas with five buildings that are 3 storeys or 10 m (35 ft.) or more in height, or districts that have a Basic Fire Flow greater than 3,300 lpgm, or any combination of these criteria, should have a Ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed Ladder companies for fire insurance grading to receive maximum credit. There are multiple buildings within the HRM Response Zone 2 that are three storeys or more in height. In addition several of the calculated Required Fire Flows were greater than 3,300 IGPM. Consideration should be given to adding a Ladder to the Station 2 fleet. An adequately housed and staffed Ladder apparatus would improve the overall Ladder service credit received within the fire insurance grading of Station 2.

Fire Station 2 received Support Ladder Credit for ladder apparatus from Stations 3, 5, 13, 12 and 7. The credit received for Support Ladders was downgraded based on the distance from the responding hall.



Station 2 received credit for 4.7 Ladders out of the maximum 4 Ladder companies that can be credited for grading.

Table 4 Credited in Service Ladder Summary

Station #	Vehicle Type	Apparatus Credit	Ladder Credit	Reserve Ladder Credit
3	Ladder	100% Ladder Credit	1	0
5	Ladder	100% Ladder Credit	1	0
13	Quint	100% Ladder Credit	1	0
12	Quint	92% Ladder Credit	0.92	0
7	Quint	78% Ladder Credit	0.78	0
	Ladder	100% Reserve Credit	0	1
Total Ladder/Reserve Ladder Credit:			4.7	1
Maximum Credit Receivable (8,500 Igpm):			4	1

Staffing at Station 2 was evaluated in its ability to meet the staffing requirements as determined by the Basic Fire Flow benchmark from the Table of Effective Response. The staffing was measured against the FUS benchmark of at least six competent career fire fighters available and assigned to respond to fire for duty with each required Engine and Ladder Company. The number of first due (initial response) engine companies and ladder companies based on the benchmark Basic Fire Flow of 8,500 IGPM is three engine companies and three ladder companies. The maximum credit that Station 2 can receive for initial available fire force response for three engine companies and three ladder companies is 36 fire fighters. NFPA 1710 requires each fire apparatus to be staffed with a minimum of four personnel. The current response from Station 2 is a single engine staffed with four fire fighters with support from Fire Stations 3, 4 and 5 in the urban core. It is recommended that an additional crew be placed in Station 2 to improve the available fire force required for initial response.

Station Location

Station 2 is well located in the south end of Halifax. The highest concentration of institutional buildings and older wood framed structures in HRM are located within Station 2 fire protection area. In addition to this the station also covers a number of specialized risks such as a rail yard, container pier and grain elevators. These risks require the placement of a ladder in Station 2. Figure 1 identifies the 2.5 km, 5 km and 8 km coverage areas for Station 2. The blue area is the 2.5 km response zone which represents the



ideal coverage for buildings with high Required Fire Flows within fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

Fire calls

The historical calls for Station 2 cover a large area of the HRM. Figure 3 shows the response of Station 2 based on its historical calls for the years 2010 to September 2013. Station 2 responded to an average of 902 calls in the 45 months. The following table is a breakdown of the calls from 2010 to September 2013. The total calls for 2013 reflect the calls received in the first 9 months of the year.

Table 5 Total Emergency calls per year.

Total Calls per Year 2010 - 2013	
Year	Calls
2010	932
2011	834
2012	951
2013	667

Table 6 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	241	80	7.12
False alarm	1,906	635	56.32
Smoke	447	149	13.21
Motor Vehicle Accident	241	80	7.12
Oil or Gas spill	49	16	1.44
Other	99	33	2.93
Rescue	13	4	0.38
Medical Assist	111	37	3.28
Coding	277	92	8.20



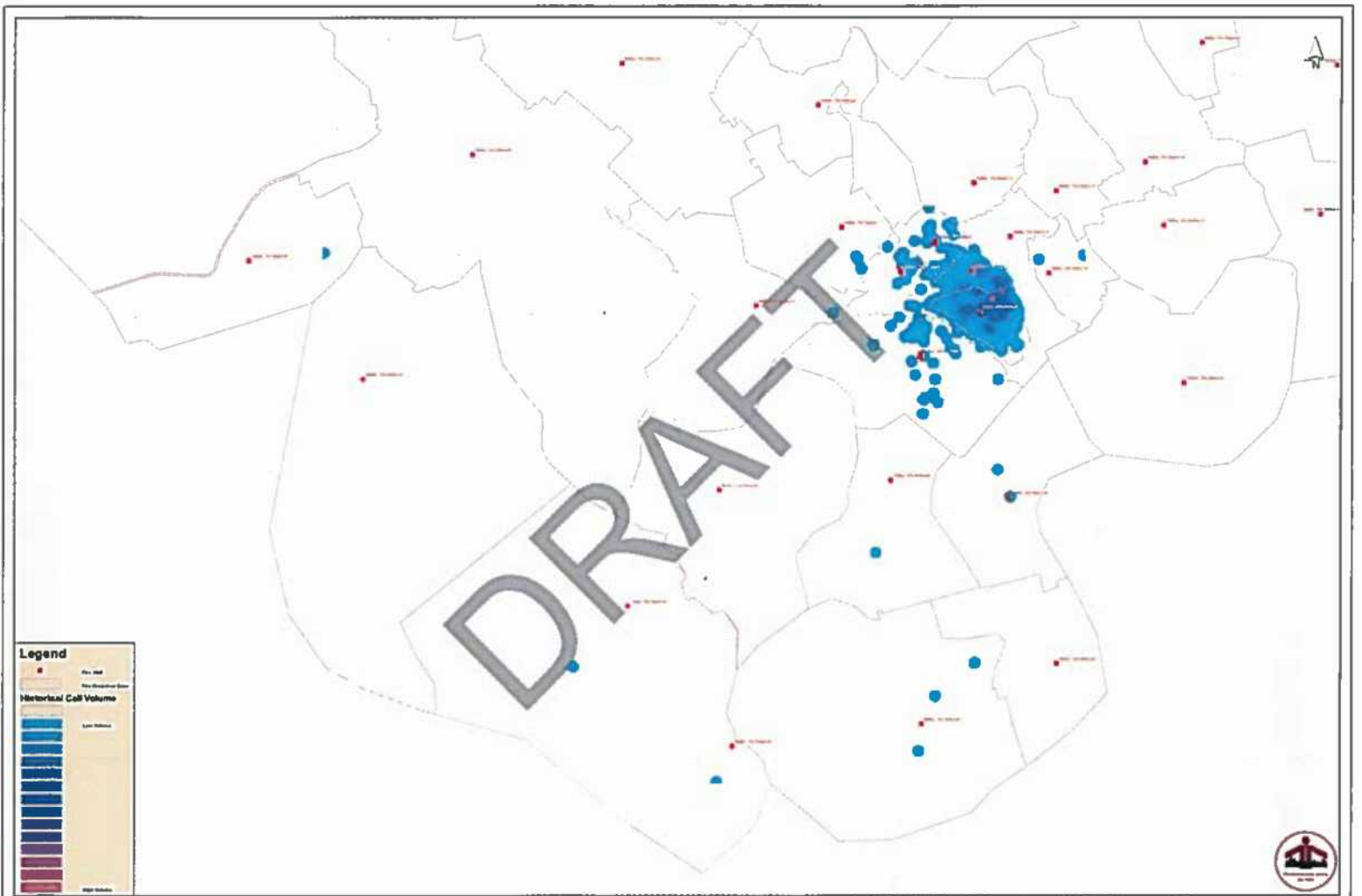
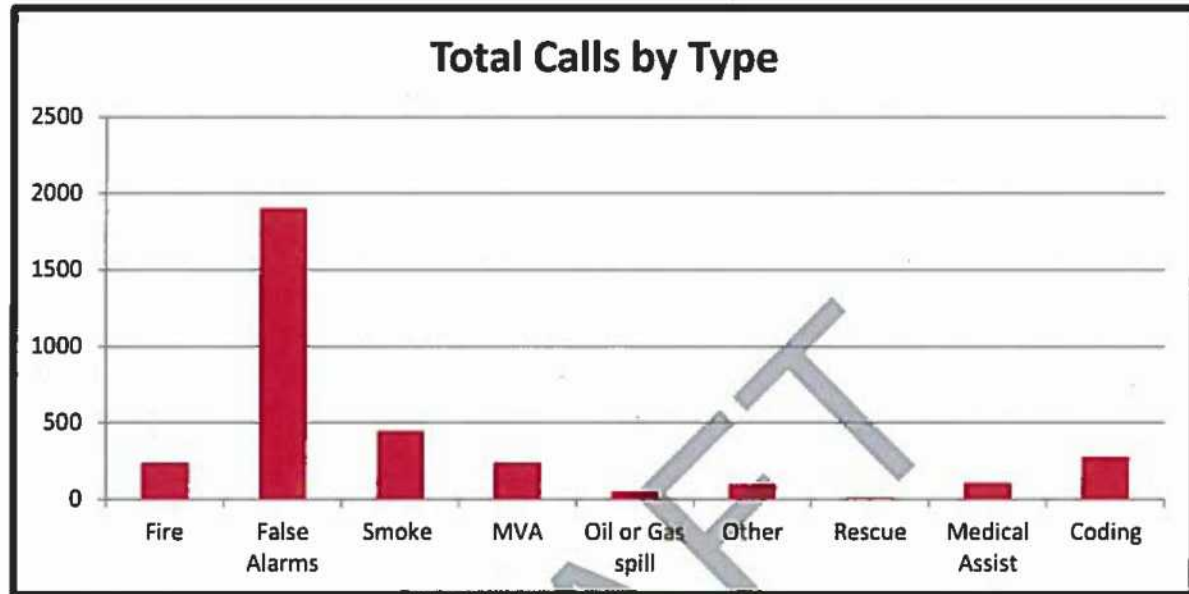


Figure 3 Historical Call Map - Fire Station 2

Figure 4 Emergency Calls by Incident Type



The largest percentage of calls to Station 2 was False Alarm (detectors) fire calls. Currently there is a fine applied to false alarms but it was found to be minimal. The resulting cost of time, apparatus and personnel responding to a fire alarm should be considered when determining applicable fines. The fines should be increased so as to deter false alarms and encourage building owners to maintain and repair fire alarm systems rather than pay a fine for a false alarm. There were several motor vehicle accident calls. Motor Vehicle Accidents have a fund in Nova Scotia created by the provincial government and calls should be billed out by the City to the province. Fire departments can submit their invoice for services provided as a result of an accident involving a motor vehicle or for a loss to a motor vehicle (i.e. fire) to the Province. A total of 1,685 emergency calls occurred during the day time hours i.e. between 7:00 a.m. and 5:00 p.m. This represents 50 percent of the total emergency calls over the three years.

Table 7 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	626	18.5%
Daytime	0700 – 1659	1,685	49.7%
Evening	1700 – 2359	1,073	31.8%



In reviewing the emergency call data it was noted that improvements need to be made in the call reporting procedure. HRM should implement a standard around the time stamping of fire calls and review each month for conformance with the standard and conformance with the “Service Delivery Standards for Halifax Regional Fire and Emergency” for all portions of the call listed in the service delivery standard.

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Within the HRM Relative Classifications for Emergency Communications, Fire Prevention and Safety Control were determined and applied as a single grade across the entire city.

Relative Classifications for Fire Department and Water Supplies were calculated specifically for individual areas as follows:

- Relative Classification for each Fire District i.e. the primary geographic response zone for each fire station (52 stations in 2013).
- Relative Classification for each Major Pressure Zone (SCADA zone) (3 distribution areas in 2013).

The Fire Department Assessment contributes 40 percent to the total Public Fire Protection Classification grade. This is the most heavily weighted portion of the grading and as such is considered to be the most significant indicator of a community or municipality’s overall preparedness for dealing with fire emergencies.

[REDACTED] This forms the basis of the relative classification of the Fire Department.



Figure 5 Fire Department Item Weights

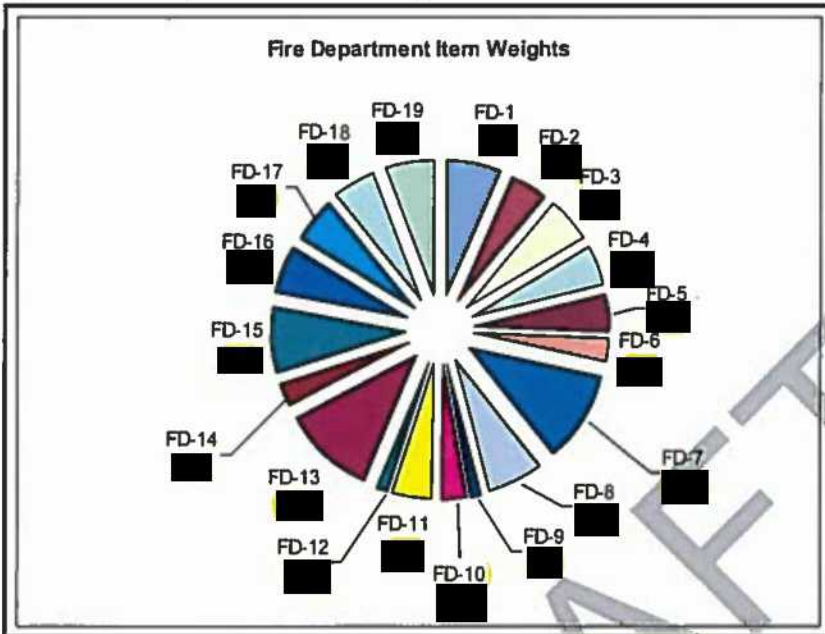


Figure 6 Fire Department Credit Points

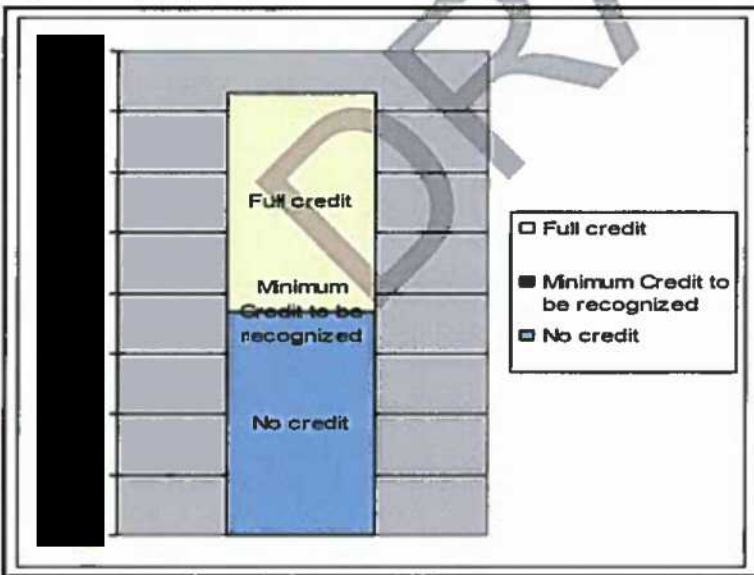
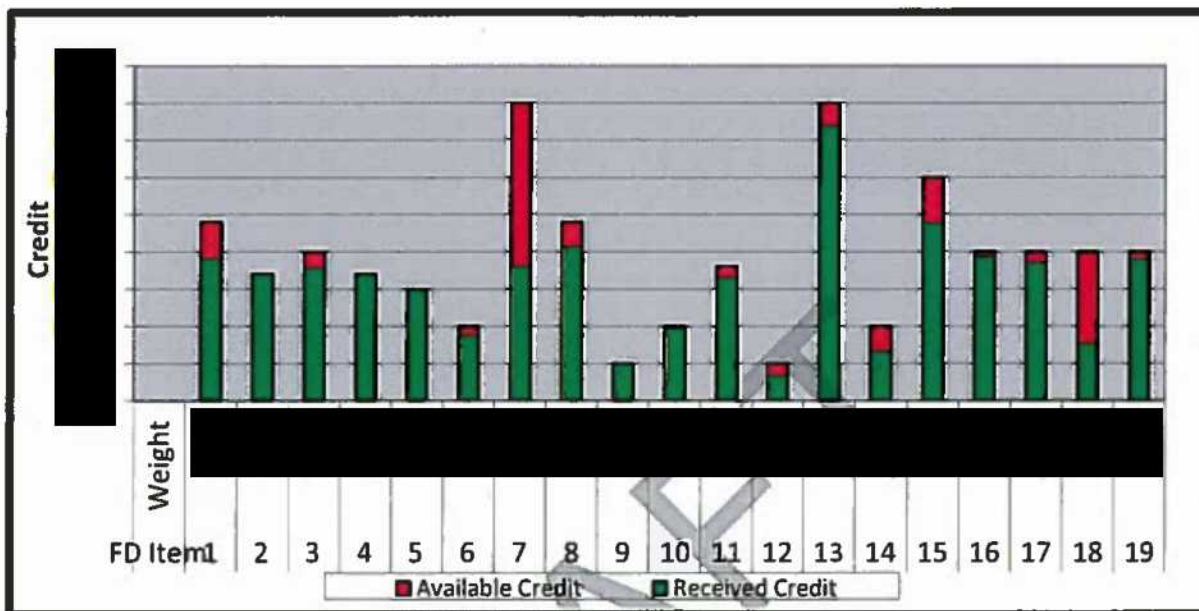


Table 8 Fire Department Grading Items Overall Summary

Grading Item	Category	Credit Received	Maximum Credit	% of FD	% of All
FD-1	Engine Service	191			
FD-2	Ladder Truck Service	170			
FD-3	Distribution of Companies and Type of Apparatus	178			
FD-4	Engine and Ladder Pump Capacity	170			
FD-5	Design, Maintenance and Condition of Apparatus	148			
FD-6	Number of Line Officers – Fire Suppression	88			
FD-7	Total Fire Force Available	180			
FD-8	Engine and Ladder Company Unit Manning	207			
FD-9	Master and Special Stream Devices	50			
FD-10	Equipment for Engines and Ladder Trucks, General	98			
FD-11	Fire Hose	165			
FD-12	Condition of Fire Hose	33			
FD-13	Training and Qualifications	369			
FD-14	Response to Alarms	67			
FD-15	Fire Ground Operations	238			
FD-16	Special Protection Required	194			
FD-17	Miscellaneous Factors and Conditions	185			
FD-18	Pre-Incident Planning	77			
FD-19	Administration	190			
[REDACTED]					
[REDACTED]					
[REDACTED]					
Weight in Grading	40			Credit Received	25.48
Relative Classification					
4					



Figure 7 Fire Department Grading Items Overall Summary



Fire Station 2 was assigned a Relative Classification of 4. The figure above shows each grading item of the fire department and how much credit was received and how much credit is still available within each grading item. The relative classification contributes to the overall Public Fire Protection Classification (PFPC) of Fire District 2 and that of the entire Halifax Regional Municipality. Factoring in the Water Supply, Fire Safety Control and Emergency Communication grading items, Fire Station 2 was assigned an overall Public Fire Protection Classification of 4. In order to maintain the current level of grading the need for the Aerial apparatus and crew will have to be addressed.

Maintaining the Public Fire Protection Classification for Station 2 will ensure residents within the fire protection area receive the full benefit of available property insurance premium discounts based on the level of fire protection provided. In the event the Station 2 is downgraded the resulting cost to the tax payer in the form of insurance costs is approximately \$1,600,000.00 in insurance premium increases for the zone. These values are estimates only as insurance rates are dynamic and dependent on a large number of factors. A further point to consider is that as the PFPC decreases in value, i.e. going from PFPC 5 to PFPC 4 the capacity of an insurer to underwrite in the City can change and in turn can create



competition which can lower rates. It is difficult to quantify the true effects and figures given here are estimates.

Table 9 Premium Estimates under the Public Fire Protection Classification System – Response Zone 2

Public Fire Protection Classification	Total Premium Estimates Prior to FUS Study	Total Premium Estimates Post FUS Study	Total Premium Estimates Difference
3	\$20,111,765		
4		\$21,720,707	\$1,608,942
5		\$33,184,413	\$13,072,648

Recommendations

- Place an Aerial (platform) apparatus in Station 2.
- Assign minimum four person crew in addition to the four firefighters now stationed at Station 2 to attain minimum staffing of 8. Note that there are a number of repairs and renovations required at Station 2 before the Aerial and crew can be assigned to the station.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 3
5663 West Street

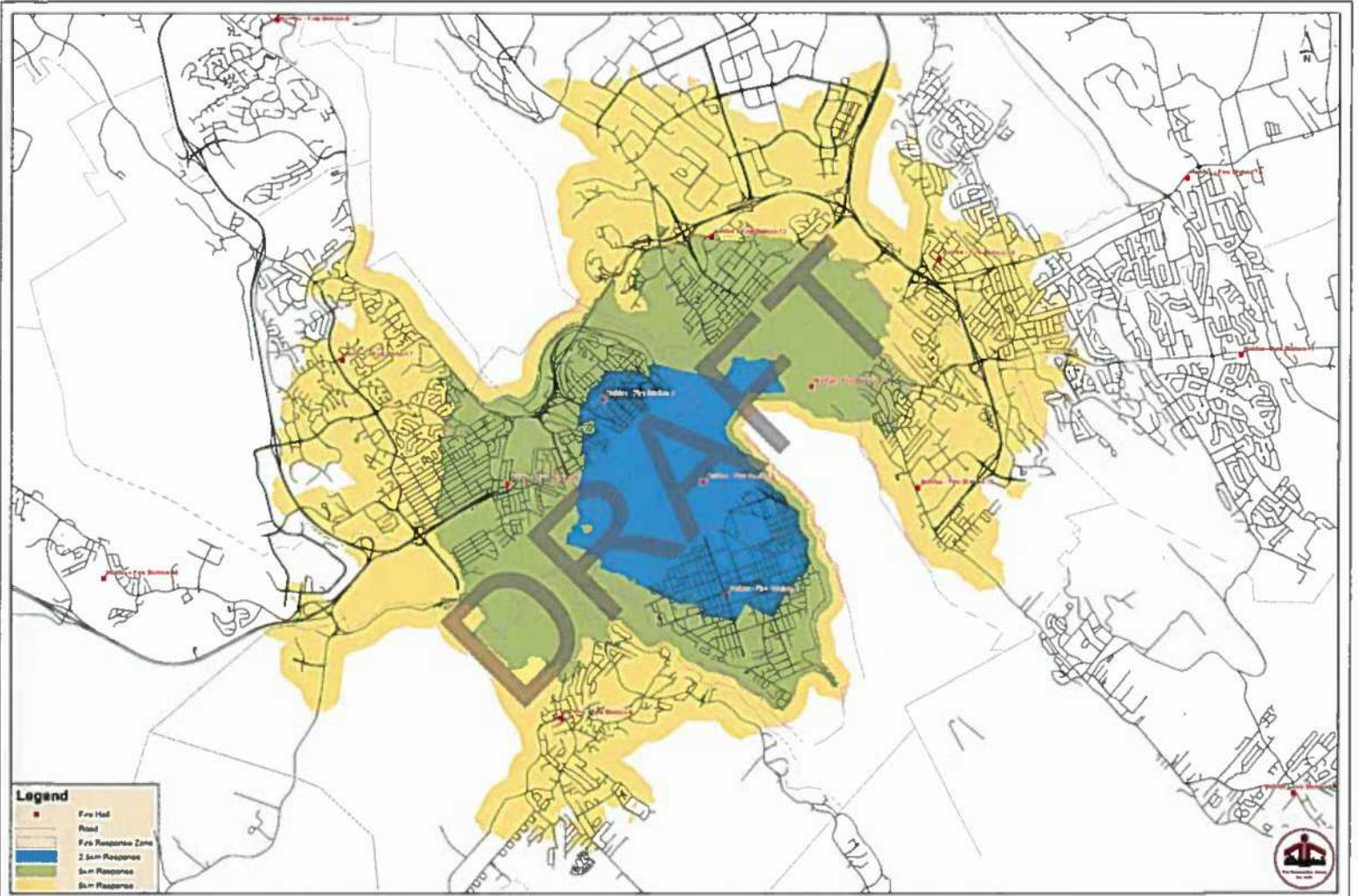


Station 3 is located at 5663 West Street, Halifax and is bordered by Maynard Street to the northeast. The station is located in a fairly central position for response to its overall coverage area. Figure 1 shows the 2.5 km, 5 km and 8 km coverage from Station 3.

Building and Tarmac

All fire stations should be of substantial construction, suitable for the services provided, and located and arranged for ease and quickness of response. Fire Station 3 consists of two buildings both of which were constructed in 1969. Both buildings are constructed of structural concrete with an exterior envelope of brick veneer and precast panels. The roof coverings consist of a built-up roof system. The tarmac is a concrete covered area which extends from the bay door to West Street. The tarmac area is sufficient for vehicle run ups and day routines.





Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. Facilities in the main building consist of an apparatus bay, sleeping quarters, a day room and kitchen, fitness area, a captain's office, logistics offices, and a training tower. The second building houses storage for testing and filling equipment for respiratory systems. These storage areas should be renovated and utilized as offices for administrative purposes.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

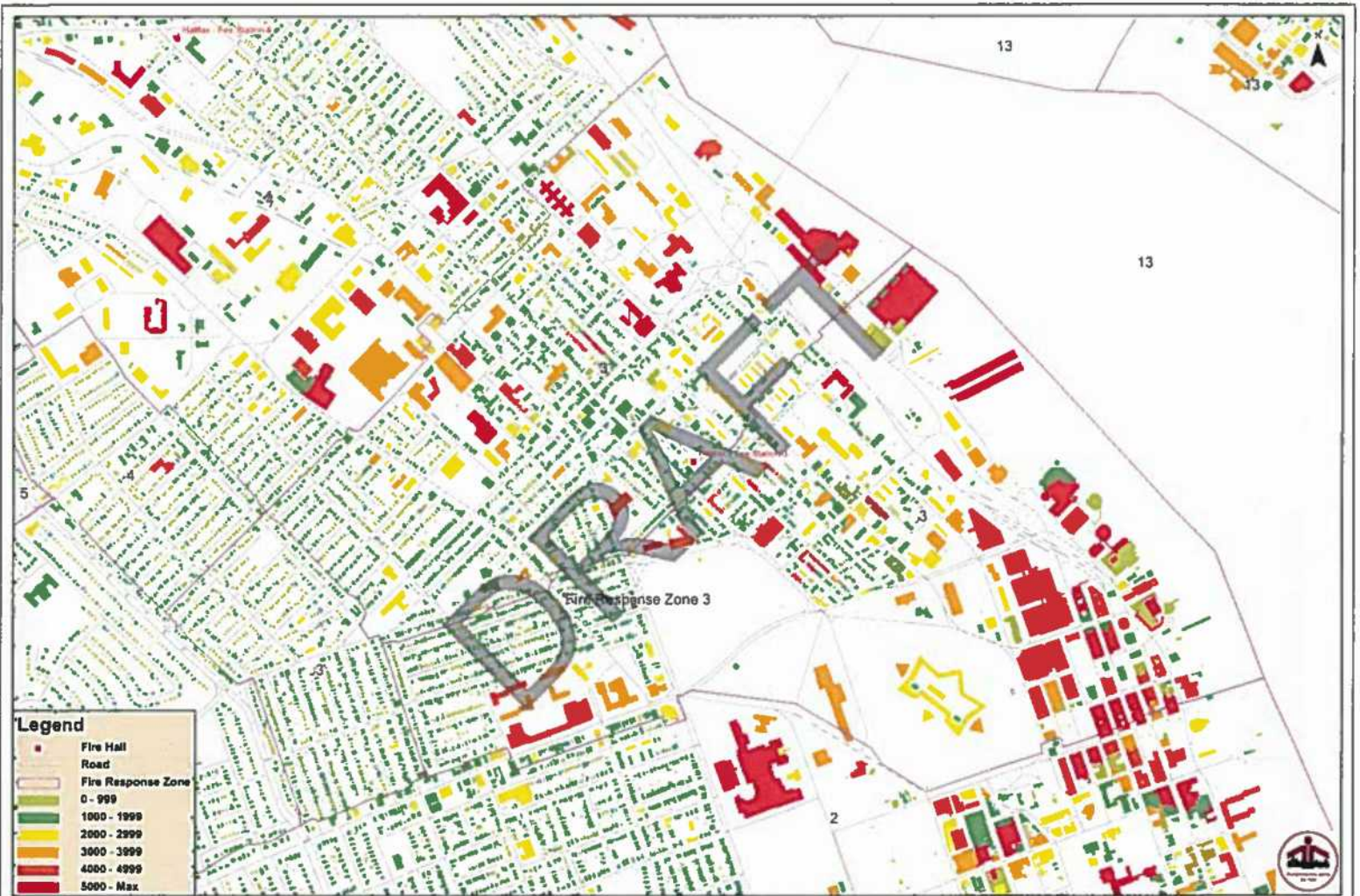
Community Risk Profile – Response Zone 3

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 3,219 Required Fire Flows were calculated for Response Zone 3 as shown in Figure 2 below. Table 1 below shows the number of Required Fire Flows calculated for each RFF range.

Table 1 Required Fire Flow ranges in Response Zone 3

RFF Range	No. of RFF points
0-999 IGPM	1,323
1,000-1,999 IGPM	1,660
2,000-2,999 IGPM	132
3,000-3,999 IGPM	47
4,000-4,999 IGPM	21
>=5,000 IGPM	36





In addition the Basic Fire Flow was determined for the response area. The Basic Fire Flow is usually calculated as the 95th percentile RFF value or the 5th highest in the Fire Response Area. Considerations are given to the exposure risk, quantity of risks, and type of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response Zone 3 is based on the fifth highest which is 7,700 Imperial Gallons per Minute.

Table 2 Basic Fire Flows for HRM Response Zone 3

Total RFF Points	3,219	
	IGPM	L/s
90th Percentile	1,700	128.86
95th Percentile	2,400	181.92
Max	10,200	773.16
5th highest	7,700	583.66

Apparatus & Personnel

Standard staffing for Station 3 is a 6 person 24/7 shift. Apparatus assignment for Station 3 is one Ladder and one Engine Company.

Station 3 was evaluated for the number of Engine and Ladder Companies in service relative to the overall fire potential and the area being protected. Apparatus are required to be adequately housed and staffed. Fire apparatus that serve dual purposes are evaluated based on the primary duty it serves on the fire ground. The Total Credited Engine Companies is calculated by [REDACTED]

[REDACTED] The credit may be downgraded from 100 percent based on reliability factors such as age, quality, listing, pump test results and distance.

Based on the Basic Fire Flow of 7,700 IGPM, the apparatus requirements for Fire Station 3 as defined in the Fire Underwriters Survey - Table of Effective Response is as follows:

- First due Pumper Company in 2.5 minutes.
- Second due Pumper Company in 3.5 minutes.



- First due Ladder Company in 3.5 minutes.

The benchmark number of apparatus required is 9 Pumper companies in 8 minutes and 3 Ladder companies in 9 minutes. These requirements reflect the apparatus need to attain maximum credit in the Engine and Ladder items of the fire department grading and serve as a benchmark against which response is measured. Ladders received 50 percent credit as Engine apparatus and 100 percent credit as Ladder apparatus. Fire Station 3 received credit for 7.97 Engines out of the maximum 9 Engine companies that can be credited for grading.

Table 3 Credited in Service Engine Summary

Station #	Vehicle Type	Apparatus Credit	Engine Credit	Reserve Engine Credit
3	Engine	100% Engine Credit	1	0
3	Ladder	50% Engine Credit	0.5	0
2	Engine	100% Engine Credit	1	0
4	Engine	100% Engine Credit	1	0
13	Quint	50% Engine Credit	0.5	0
5	Quint	50% Engine Credit	0.5	0
12	Quint	50% Engine Credit	0.5	0
6	Engine	100% Engine Credit	1	0
15	Engine	100% Engine Credit	1	0
14	Engine	97% Engine Credit	0.97	0
Total Engine Credit:			7.97	1
Maximum Credit Receivable (7,700 Igpm):			9	1

Response areas with five buildings that are 3 storeys or 10 m (35 ft.) or more in height, or districts that have a Basic Fire Flow greater than 3,300 IGPM, or any combination of these criteria, should have a Ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed Ladder companies for fire insurance grading to receive maximum credit. There are multiple buildings within the HRM Response Zone 3 that are three storeys or more in height. In addition several of the calculated Required Fire Flows were greater than 3,300 IGPM. Currently there is one ladder stationed at Station 3. Fire Station 3 received Primary Ladder Credit for one ladder apparatus at the hall and Support Ladder Credit for two ladders



that would respond from Station 5 and 13. The credit received for Support Ladders was downgraded based on the distance from the responding hall. Station 3 received credit for 3 Ladders out of the maximum 3 Ladder companies that can be credited for grading.

Table 4 Credited in Service Ladder Summary

Station #	Vehicle Type	Apparatus Credit	Ladder Credit	Reserve Ladder Credit
3	Ladder	100% Ladder Credit	1	0
5	Quint	100% Ladder Credit	1	0
13	Quint	100% Ladder Credit	1	0
	Ladder	100% Reserve Credit	0	1
Total Ladder/Reserve Ladder Credit:			3	1
Maximum Credit Receivable (7,700 Igpm):			3	1

Staffing at Station 3 was evaluated in its ability to meet the staffing requirements as determined by the Basic Fire Flow benchmark from the Table of Effective Response. The staffing was measured against the FUS benchmark of at least six competent career fire fighters available and assigned to respond to fire for duty with each required Engine and Ladder Company. The number of first due (initial response) engine companies and ladder companies based on the benchmark Basic Fire Flow of 7,700 IGPM is three Engine companies and one Ladder company. The maximum credit that Station 3 can receive for initial available fire force response for three engine companies and one ladder companies is 24 fire fighters. NFPA 1710 requires each fire apparatus to be staffed with a minimum of four personnel. The current initial response from Station 3 is one Engine staffed with four fire fighters and a Ladder staffed with two fire fighters, with support from Fire Stations 2, 4 and 5 in the urban core.

It is recommended that the Ladder apparatus and crew at Station 3 be transferred to Station 2. An additional Engine with 1,750 IGPM pumping capacity and manned by a four person crew should be assigned to Station 3. This would be achieved by relocating the four person crew from Station 4 to Station 3 and transferring one Quint to Station 3.



Station Location

Figure 1 identifies the 2.5 km, 5 km and 8 km coverage areas for Station 3. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows within fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

Fire calls

The historical calls for Station 3 cover a large area of the HRM. Figure 3 shows the response of Station 3 based on its historical calls for the years 2010 to September 2013. Station 3 responded to an average of 651 calls in the 45 months. The following table is a breakdown of the calls from 2010 to September 2013. The total calls for 2013 reflect the first 9 months of the year.

Table 5 Total Emergency calls per year.

Total Calls per Year 2010 - 2013	
Year	No. of Calls
2010	664
2011	687
2012	635
2013	457



Table 6 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	212	56.5	8.68
False alarm	987	263	40.40
Smoke	402	149	16.46
MVA	313	107	12.81
Oil or Gas spill	7	2	0.29
Other	128	34	5.24
Rescue	11	3	0.45
Med Assist	106	28	4.34
Coding	277	74	11.33

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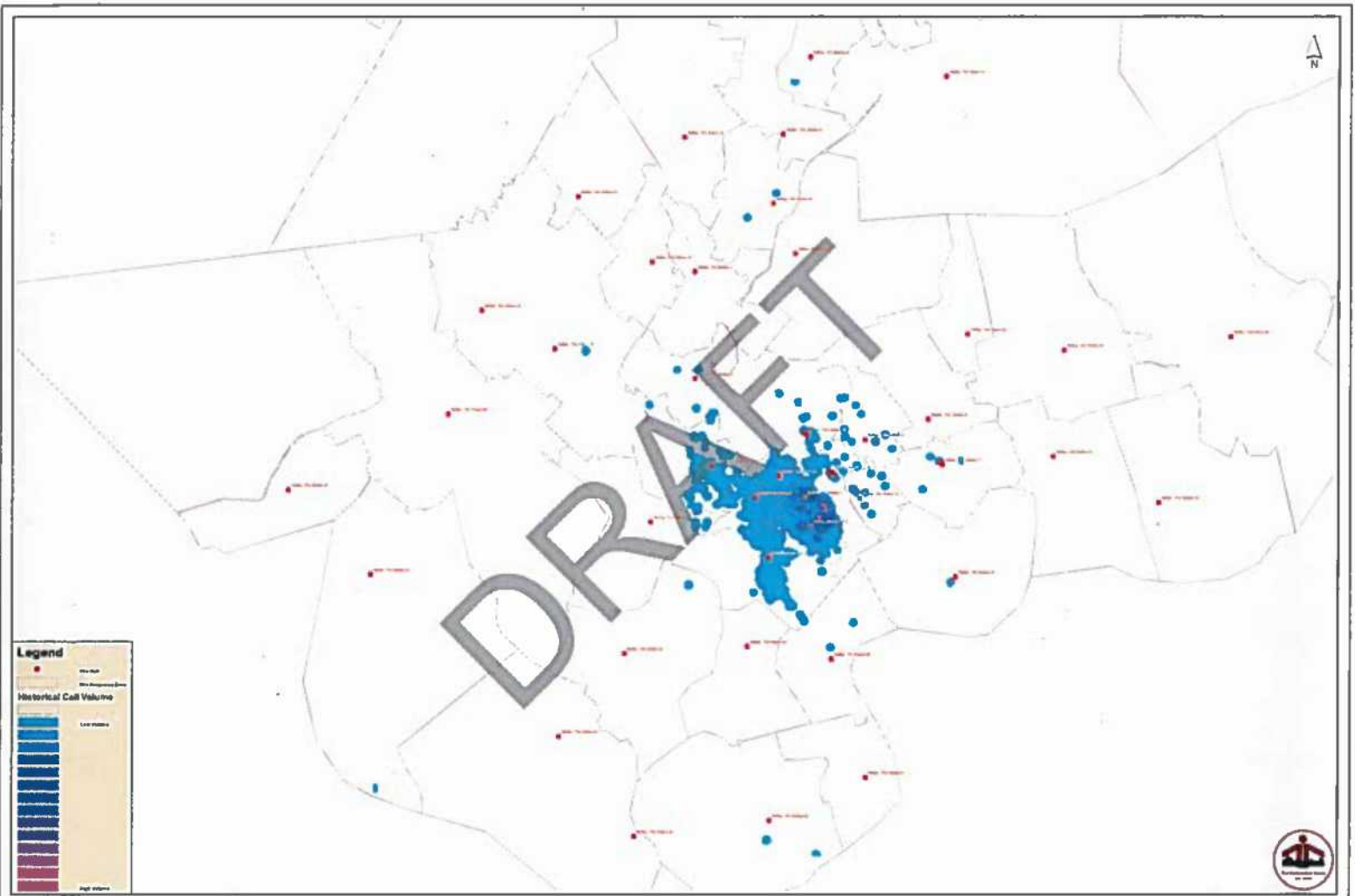
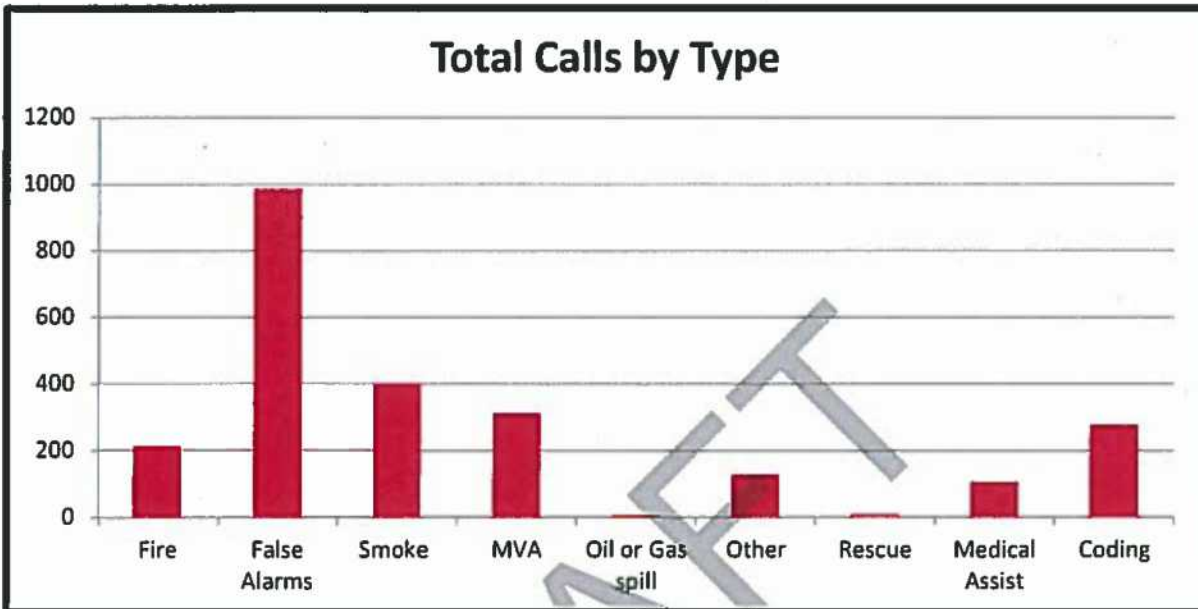


Figure 3 Historical Call Map - Fire Station 3

Scale = 1:70,000

Figure 4 Emergency Calls by Incident Type (2010-2013)



The largest percentage of calls to Station 3 was False Alarm (detectors) fire calls. Currently there is a fine applied to false alarms but it was found to be minimal. The resulting cost of time, apparatus and personnel responding to a fire alarm should be considered when determining applicable fines. The fines should be increased so as to deter false alarms and encourage building owners to maintain and repair fire alarm systems rather than pay a fine for a false alarm. There were several motor vehicle accident calls. Motor Vehicle Accidents have a fund in Nova Scotia created by the provincial government and calls should be billed out by the City to the province. Fire departments can submit their invoice for services provided as a result of an accident involving a motor vehicle or for a loss to a motor vehicle (i.e. fire) to the Province.

In reviewing the emergency call data it was noted that improvements need to be made in the call reporting procedure. HRM should implement a standard around the time stamping of fire calls and review each month for conformance with the standard and conformance with the "Service Delivery Standards for Halifax Regional Fire and Emergency" for all portions of the call listed in the service delivery standard.



Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Within the HRM Relative Classifications for Emergency Communications, Fire Prevention and Safety Control were determined and applied as a single grade across the entire city.

Relative Classifications for Fire Department and Water Supplies were calculated specifically for individual areas as follows:

- Relative Classification for each Fire District i.e. the primary geographic response zone for each fire station (52 stations in 2013).
- Relative Classification for each Major Pressure Zone (SCADA zone) (3 distribution areas in 2013).

The Fire Department Assessment contributes 40 percent to the total Public Fire Protection Classification grade. This is the most heavily weighted portion of the grading and as such is considered to be the most significant indicator of a community or municipality's overall preparedness for dealing with fire emergencies. [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED] This forms the basis of the relative classification of the Fire Department.



Figure 5 Fire Department Item Weights

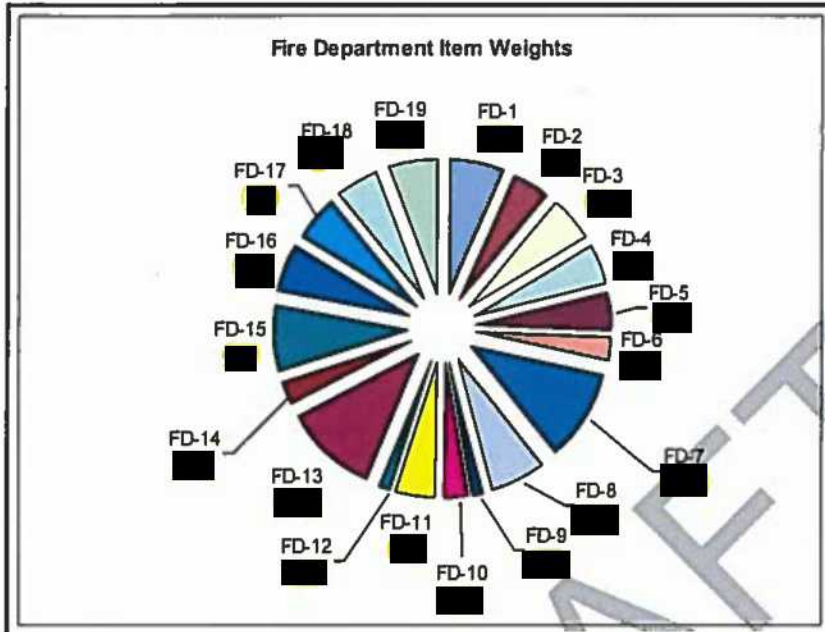


Figure 6 Fire Department Credit Points

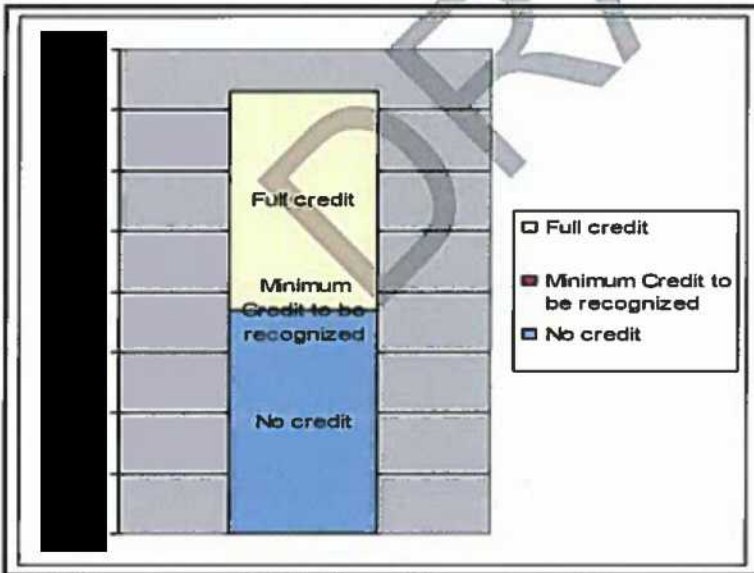


Table 7 Fire Department Grading Items Overall Summary

Grading Item	Category	Credit Received	Maximum Credit	% of FD	% of All
FD-1	Engine Service	224			
FD-2	Ladder Truck Service	164			
FD-3	Distribution of Companies and Type of Apparatus	200			
FD-4	Engine and Ladder Pump Capacity	170			
FD-5	Design, Maintenance and Condition of Apparatus	148			
FD-6	Number of Line Officers – Fire Suppression	82			
FD-7	Total Fire Force Available	220			
FD-8	Engine and Ladder Company Unit Manning	210			
FD-9	Master and Special Stream Devices	50			
FD-10	Equipment for Engines and Ladder Trucks, General	98			
FD-11	Fire Hose	165			
FD-12	Condition of Fire Hose	33			
FD-13	Training and Qualifications	369			
FD-14	Response to Alarms	67			
FD-15	Fire Ground Operations	268			
FD-16	Special Protection Required	194			
FD-17	Miscellaneous Factors and Conditions	185			
FD-18	Pre-Incident Planning	77			
FD-19	Administration	190			
[REDACTED]					
[REDACTED]					
[REDACTED]					
Weight in Grading	40			Credit Received	28.19
Relative Classification					
3					



Figure 6 Fire Department Grading Items Overall Summary



Fire Station 3 was assigned a Relative Class of 3. The figure above shows each grading item of the fire department and how much credit was received and how much credit is still available within each grading item. The relative classification contributes to the overall Public Fire Protection Classification (PFPC) of Fire District 3 and that of the entire Halifax Regional Municipality. Factoring in the Water Supply, Fire Safety Control and Emergency Communications grading items, Fire Station 3 was assigned an overall Public Fire Protection Classification of 4. This indicates that the level of response is proportionate to the level of risk in the fire protection district. In order to maintain the current level of grading the need for an additional Engine company and crew should be addressed.

Maintaining or improving the Public Fire Protection Classification for Station 3 will ensure residents within the fire protection area receive the full benefit of available property insurance premium discounts based on the level of fire protection provided. If Station 3 is downgraded to a PFPC 4 the resulting cost to the tax payer in the form of insurance premium increases would be approximately \$1,000,000.00 for the zone as shown in Table 8 below. These values are estimates only as insurance rates are dynamic and dependent on a large number of factors. A further point to consider is that as the PFPC decreases in value, i.e. going from PFPC 5 to PFPC 4 the capacity of an insurer to underwrite in the



City can change and in turn can create competition which can lower rates. It is difficult to quantify the true effects and figures given here are estimates.

Table 8 Premium Estimates under the Public Fire Protection Classification System – Response Zone 3

Public Fire Protection Classification	Total Premium Estimates Prior to FUS Study	Total Premium Estimates Post FUS Study	Total Premium Estimates Difference
3	\$12,509,323		
4		\$13,510,068	\$1,000,745
5		\$20,640,383	\$7,130,315

Recommendations

- The Ladder apparatus and crew at Station 3 should be transferred to Station 2.
- A Quint of 1,750 IGPM pumping capacity and manned by a four person crew should be placed at Station 3. This would be achieved by relocating the four person crew from Station 4 to Station 3 and transferring one Quint to Station 3.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 4
5830 Duffus Street



Station 4 is located at 5830 Duffus Street in Halifax and is bordered by Robie Street to the south and west, and Lady Hammond Road to the north and east. The station exits onto Duffus Street and is located in a fairly central position for response to its overall coverage area. Figure 1 shows the 2.5 km, 5 km and 8 km coverage from Station 4.

Building and Tarmac

All fires stations should be of substantial construction, suitable for the service, and located and arranged for ease and quickness of response. Fire Station 4 is constructed of brick veneer and was originally constructed in 1973. The roof construction is a built up system supported by a poured concrete base on metal decking. The tarmac is a concrete covered area which extends from the bay door to the street. The tarmac area is sufficient for vehicle run ups and day routines.



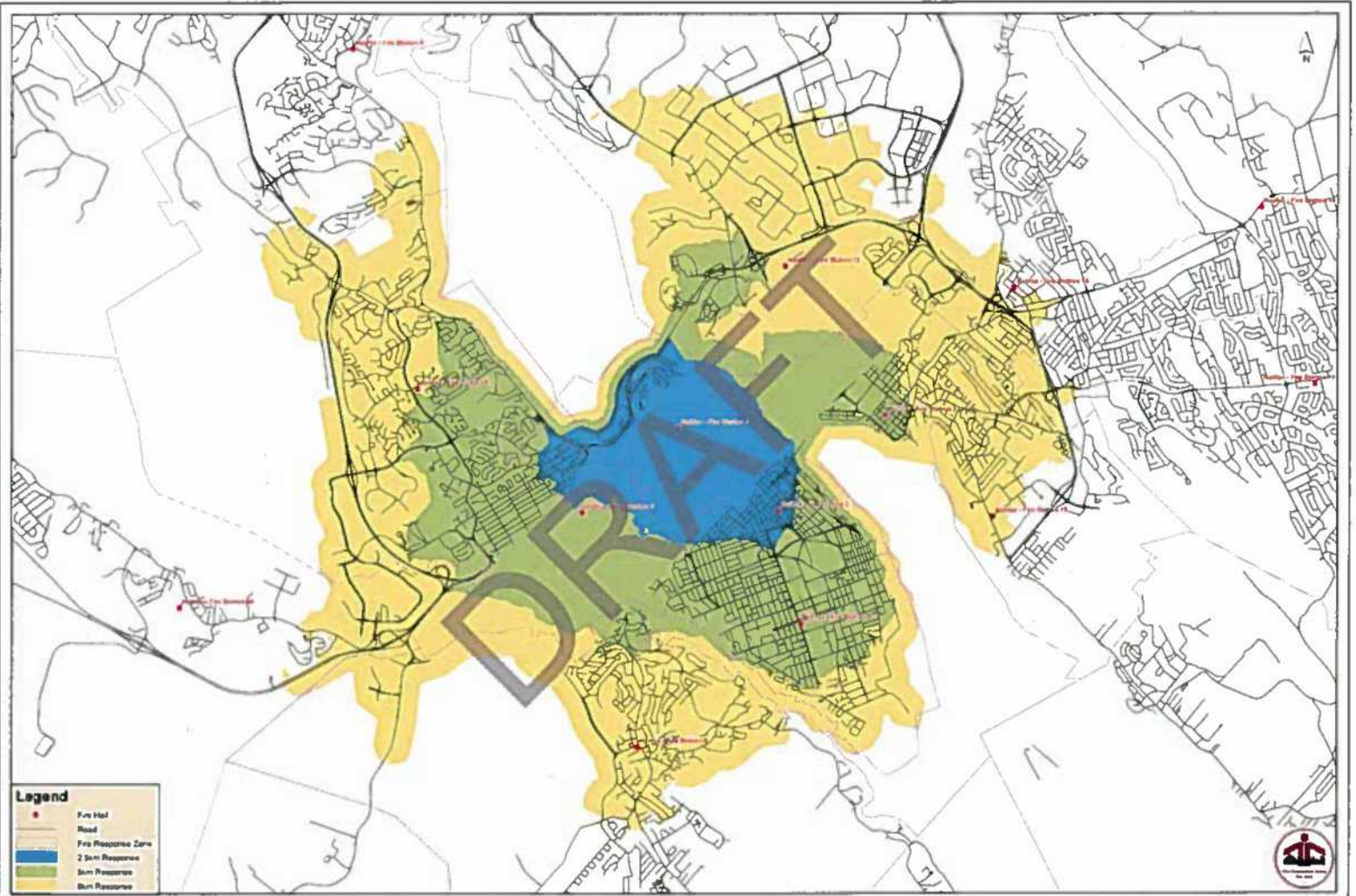


Figure 12 5/5km Response from Fire Station 4

Scale = 1:18,000

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. Facilities in the main building consist of an apparatus bay, sleeping quarters, a day room and kitchen, fitness area, a captain's office, and the Union's office. The facilities in Station 4 are adequate to meet the needs of the staff.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

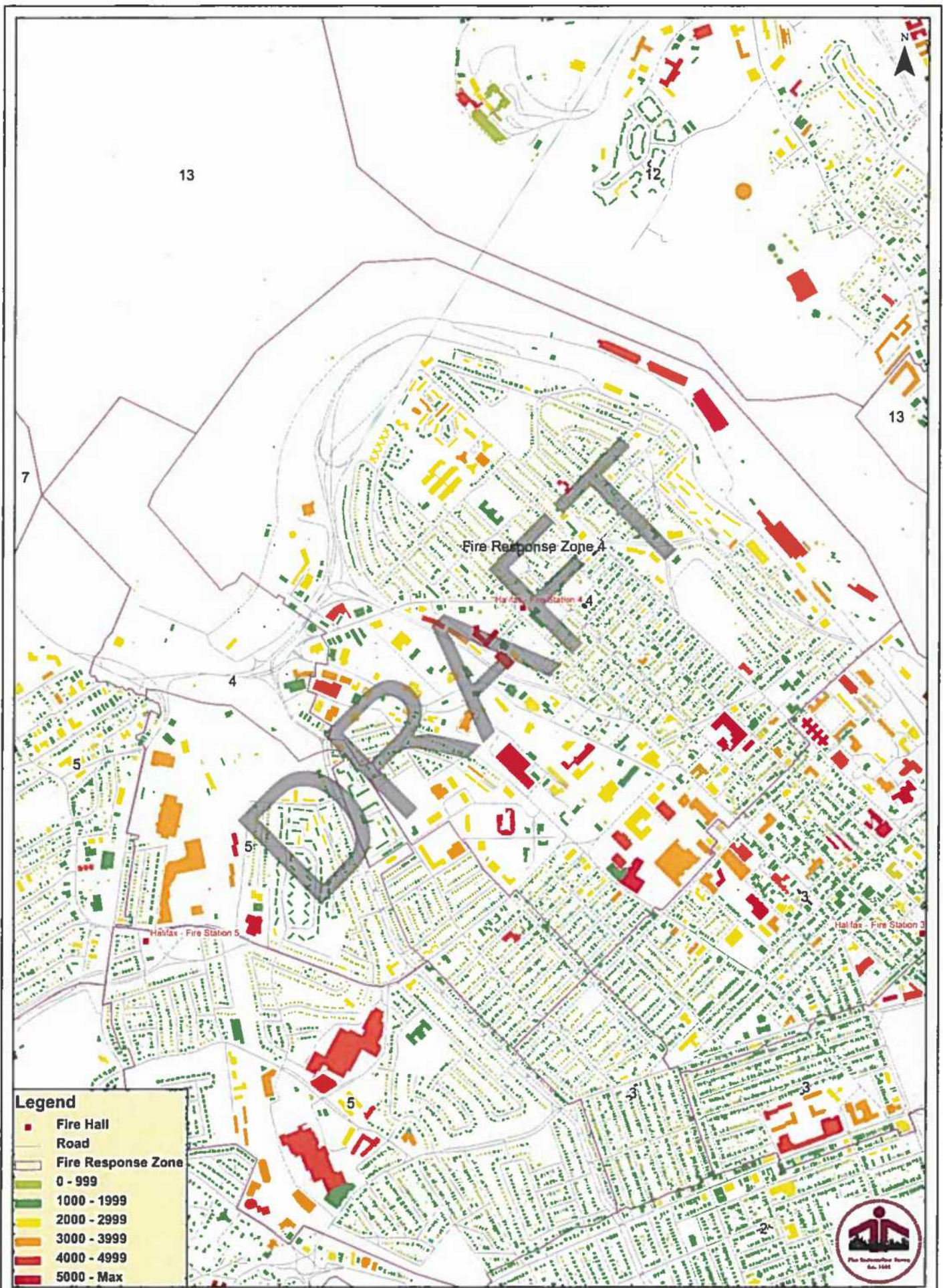
Community Risk Profile – Response Zone 4

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 3,631 Required Fire Flows were calculated for Response Zone 4 as shown in Figure 2 below. Table 1 below depicts the average Required Fire Flows calculated.

Table 1 Required Fire Flow ranges in Response Zone 4

RFF Range	No. of RFF points
0-999 IGPM	2,033
1,000-1,999 IGPM	1,405
2,000-2,999 IGPM	143
3,000-3,999 IGPM	29
4,000-4,999 IGPM	15
$\geq 5,000$ IGPM	6





13

7

Fire Response Zone 4

Halifax - Fire Station 4

4

5

5

Halifax - Fire Station 5

Halifax - Fire Station 3

5

3

3

2

2

2

2

2

2

2

2

13

12



Fire Subcontractor Survey

In addition the Basic Fire Flow was determined for the response area. The Basic Fire Flow is usually calculated as the 95th percentile RFF value or the 5th highest in the Fire Response Area. Considerations are given to the exposure risk, quantity of risks, and type of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response Zone 4 is based on the fifth highest which is 5,300 Imperial Gallons per Minute.

Table 2 Basic Fire Flows for HRM Response Zone 4

Total RFF Points	3,631	
	IGPM	l/s
90th Percentile	1,500	113.7
95th Percentile	2,000	151.6
Max	7,500	568.5
5th highest	5,300	401.7

Apparatus & Personnel

Standard staffing for Station 4 is a 4 person 24/7 shift. Apparatus assignment for Station 4 is one Engine company.

Station 4 was evaluated for the number of Engine and Ladder companies in service relative to the overall fire potential and the area being protected. Apparatus are required to be adequately housed and staffed. Fire apparatus that serve dual purposes are evaluated based on the primary duty it serves on the fire ground. The Total Credited Engine Companies is calculated by [REDACTED]

[REDACTED] The credit may be downgraded from 100 percent based on reliability factors such as age, quality, listing, pump test results and distance.

Based on the Basic Fire Flow of 5,300 IGPM, the apparatus requirements for Fire Station 4 as defined in the Fire Underwriters Survey - Table of Effective Response is as follows:

- First due Pumper Company in 2.5 minutes.
- Second due Pumper Company in 4 minutes.



- First due Ladder Company in 3.5 minutes.

The benchmark number of apparatus required is 7 Pumper companies in 7.5 minutes and 2 Ladder companies in 5 minutes. These requirements reflect the apparatus need to attain maximum credit in the Engine and Ladder items of the fire department grading and serve as a benchmark against which response is measured. Ladders received 50 percent credit as Engine apparatus and 100 percent credit as Ladder apparatus. Fire Station 4 received credit for 5 Engines out of the maximum 7 Engine companies that can be credited for grading.

Table 3 Credited in Service Engine Summary

Station #	Vehicle Type	Apparatus Credit	Engine Credit	Reserve Engine Credit
4	Engine	100% Engine Credit	1	0
3	Ladder	50% Engine Credit	0.5	0
3	Engine	100% Engine Credit	1	0
13	Quint	50% Engine Credit	0.5	0
5	Quint	50% Engine Credit	0.5	0
7	Quint	50% Engine Credit	0.5	0
2	Engine	100% Engine Credit	1	0
Total Engine Credit:			5	0
Maximum Credit Receivable (5,300 Igpm):			7	0

Response areas with five buildings that are 3 storeys or 10 m (35 ft.) or more in height, or districts that have a Basic Fire Flow greater than 3,300 IGPM, or any combination of these criteria, should have a Ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed Ladder companies for fire insurance grading to receive maximum credit. There are multiple buildings within the HRM Response Zone 4 that are three storeys or more in height. In addition several of the calculated Required Fire Flows were greater than 3,300 IGPM. Currently there is no ladder stationed at Station 4. Fire Station 4 received Support Ladder Credit for two ladders that would respond from Station 3 and 5. The credit received for Support Ladders was downgraded based on the distance from the responding hall. Station 4 received credit for 1.85 Ladders out of the maximum 2 Ladder companies that can be credited for grading.



Table 4 Credited in Service Ladder Summary

Station #	Vehicle Type	Apparatus Credit	Ladder Credit	Reserve Ladder Credit
3	Ladder	100% Ladder Credit	1	0
5	Quint	85% Ladder Credit	0.85	0
	Ladder	100% Reserve Credit	0	1
Total Ladder/Reserve Ladder Credit:			1.85	1
Maximum Credit Receivable (5,300 Igpm):			2	1

Staffing at Station 4 was evaluated in its ability to meet the staffing requirements as determined by the Basic Fire Flow benchmark from the Table of Effective Response. The staffing was measured against the FUS benchmark of at least six competent career fire fighters available and assigned to respond to a fire for duty with each required Engine and Ladder Company. The number of first due (initial response) engine companies and ladder companies based on the benchmark Basic Fire Flow of 5,300 IGPM is two Engine companies and one Ladder company. The maximum credit that Station 4 can receive for initial available fire force response for a Basic Fire Flow of 5,300 IGPM is 18 fire fighters. Fire Station 4 was credited with 4 fire fighter equivalent units in its initial available fire force out of the maximum 18. NFPA 1710 requires each fire apparatus to be staffed with a minimum of four personnel.

Station Location

Station 4 is located in the north end of Halifax. The station's response zone is located within Station 3 and 5 first response coverage areas. When considering the first due response coverage for each of these three stations, there is a significant overlap. Station 4 is therefore redundant and should be closed. Figure 1 identifies the 2.5 km, 5 km and 8 km coverage areas for Station 4. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.



Fire calls

The historical calls for Station 4 cover a large area of the HRM. Figure 3 shows the response of Station 4 based on its historical calls for the years 2010 to September 2013. Station 4 responded to an average of 324 calls in the 45 months. The following table is a breakdown of the calls from 2010 to September 2013. The total calls for 2013 reflect the first 9 months of the year. The total fire calls at this Station are comparatively lower than other stations in the urban core. Table 6 shows the breakdown of emergency calls by incident type. The year average was calculated for all calls over the 45 months.

Table 5 Total Emergency calls per year.

Total Calls per Year 2010 - 2013	
Year	No. of Calls
2010	371
2011	310
2012	312
2013	224

Table 6 Emergency calls by Incident Type.

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	111	30	9.12
False alarm	386	103	31.71
Smoke Invest	207	55	17.00
Motor Vehicle Accidents	182	49	14.95
Oil or Gas spill	19	5	1.56
Other	43	14	3.53
Rescue	2	0.7	0.16
Medical Assist	84	28	6.90
Coding	183	61	15.03



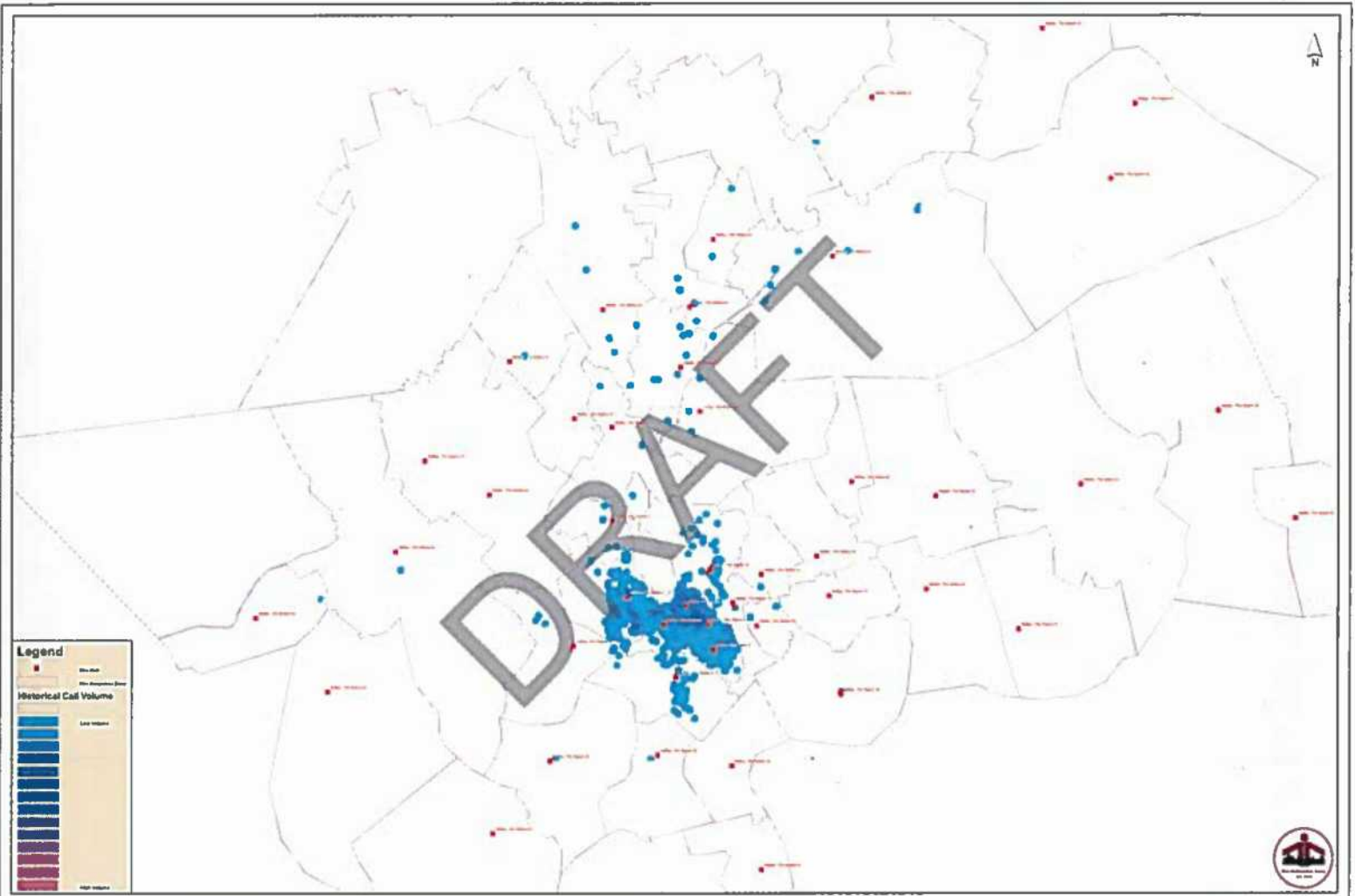
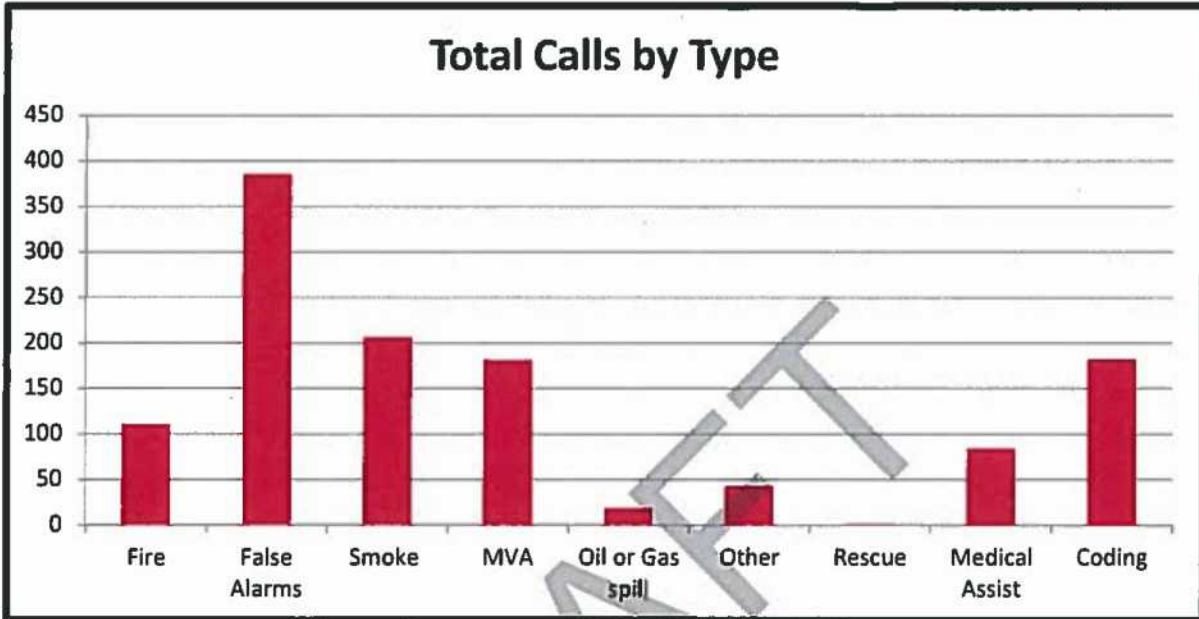


Figure 2 Historical Call Map - Fire Station 4

Scale = 1:80,000

Figure 4 Emergency Calls by Incident Type (2010-2013)



The largest percentage of calls to Station 4 was False Alarm (detectors) fire calls. Currently there is a fine applied to false alarms but it was found to be minimal. The resulting cost of time, apparatus and personnel responding to a fire alarm should be considered when determining applicable fines. The fines should be increased so as to deter false alarms and encourage building owners to maintain and repair fire alarm systems rather than pay a fine for a false alarm. There were several motor vehicle accident calls. Motor Vehicle Accidents have a fund in Nova Scotia created by the provincial government and calls should be billed out by the City to the province. Fire departments can submit their invoice for services provided as a result of an accident involving a motor vehicle or for a loss to a motor vehicle (i.e. fire) to the Province.

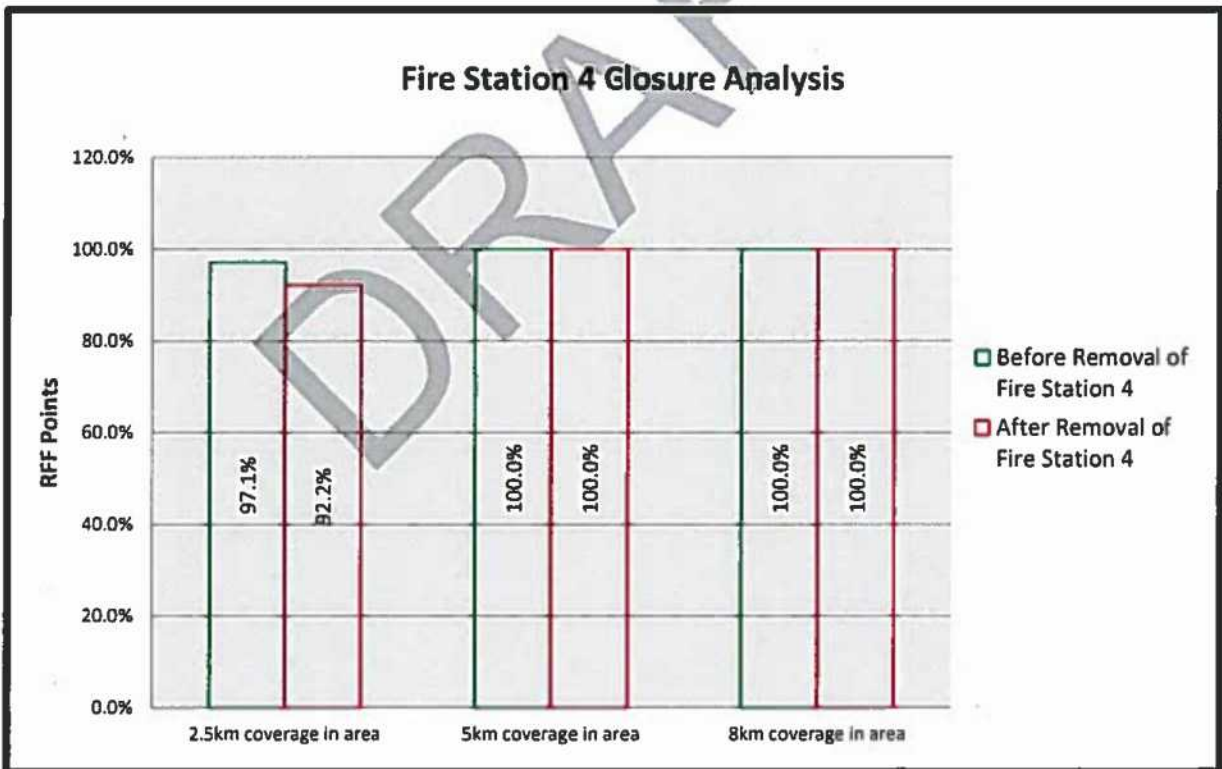
In reviewing the emergency call data it was noted that improvements need to be made in the call reporting procedure. HRM should implement a standard around the time stamping of fire calls and review each month for conformance with the standard and conformance with the "Service Delivery Standards for Halifax Regional Fire and Emergency" for all portions of the call listed in the service delivery standard.

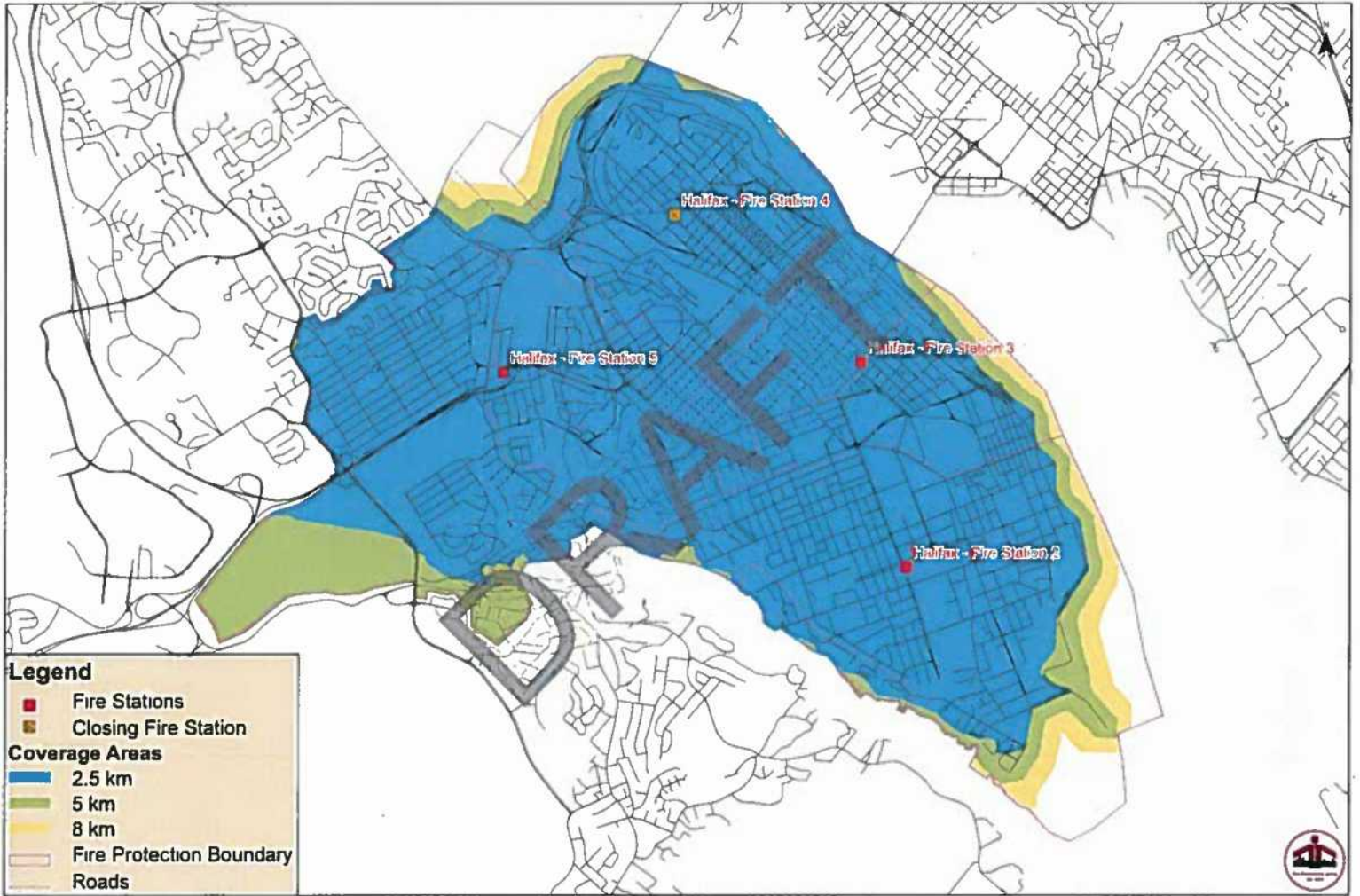


Station Closure Analysis

An analysis was carried out to examine the impact on coverage should Station 4 be closed. This was done by analysing how many risks (Required Fire Flow points) would be left uncovered following the closure of the fire hall. Figure 5 below shows the effect of closing Fire Station 4. Currently there are approximately 16,709 risks within Fire Station 4's 8 km response zone which accounts for 100 percent of risks in the response zone. Approximately 16,707 risks are within the station's 5 km response zone which is 100 percent of risks in the response zone. With the closure of Station 4, all of these risks will remain covered under 5 km and 8 km response from another station. Approximately 5 percent of the risks previously within 2.5 km will be uncovered with the closing of Station 4. However, a large majority of the risks protected by Station 4 will be unaffected by a closure of the fire hall. Figure 6 shows the areas covered by Station 4 prior to closing the station and Figure 7 shows the areas affected after closing Station 4.

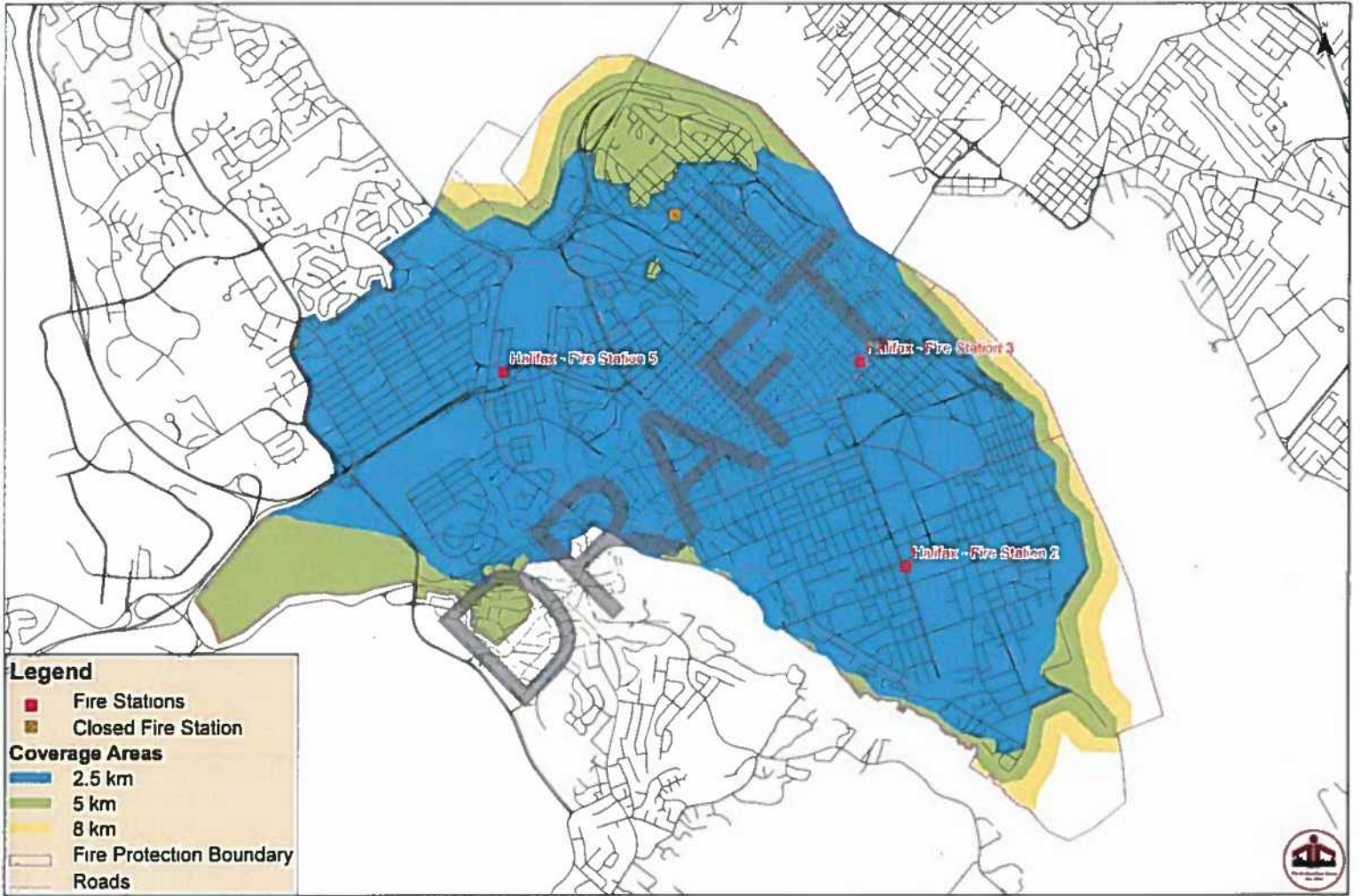
Figure 5 Fire Station 4 Closure Analysis – Percentage of RFF Points





Halifax





- Legend**
- Fire Stations
 - Closed Fire Station
- Coverage Areas**
- 2.5 km
 - 5 km
 - 8 km
 - Fire Protection Boundary
 - Roads

Halifax



Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Within the HRM Relative Classifications for Emergency Communications, Fire Prevention and Safety Control were determined and applied as a single grade across the entire city.

Relative Classifications for Fire Department and Water Supplies were calculated specifically for individual areas as follows:

- Relative Classification for each Fire District i.e. the primary geographic response zone for each fire station (52 stations in 2013).
- Relative Classification for each Major Pressure Zone (SCADA zone) (3 distribution areas in 2013).

The Fire Department Assessment contributes 40 percent to the total Public Fire Protection Classification grade. This is the most heavily weighted portion of the grading and as such is considered to be the most significant indicator of a community or municipality's overall preparedness for dealing with fire emergencies.

[REDACTED] This forms the basis of the relative classification of the Fire Department.



Figure 8 Fire Department Item Weights

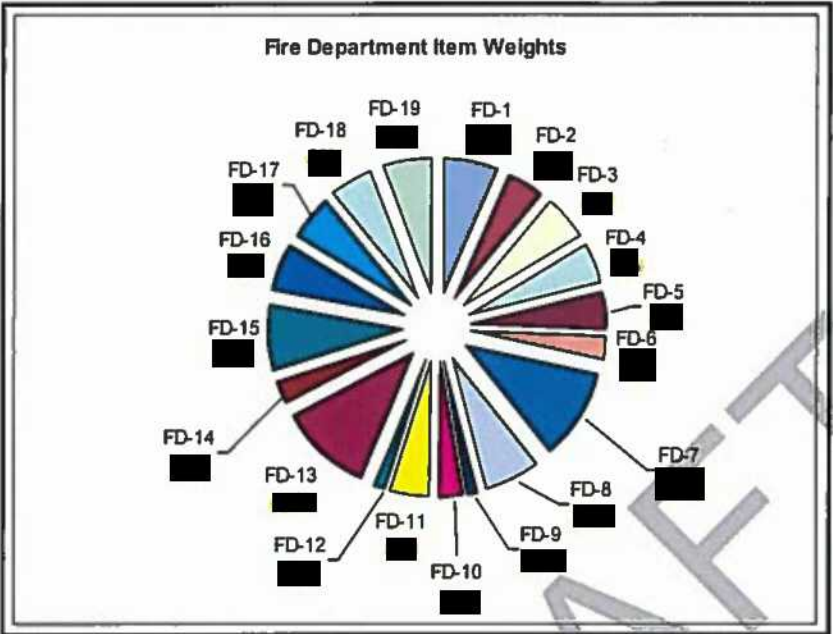


Figure 9 Fire Department Credit Points

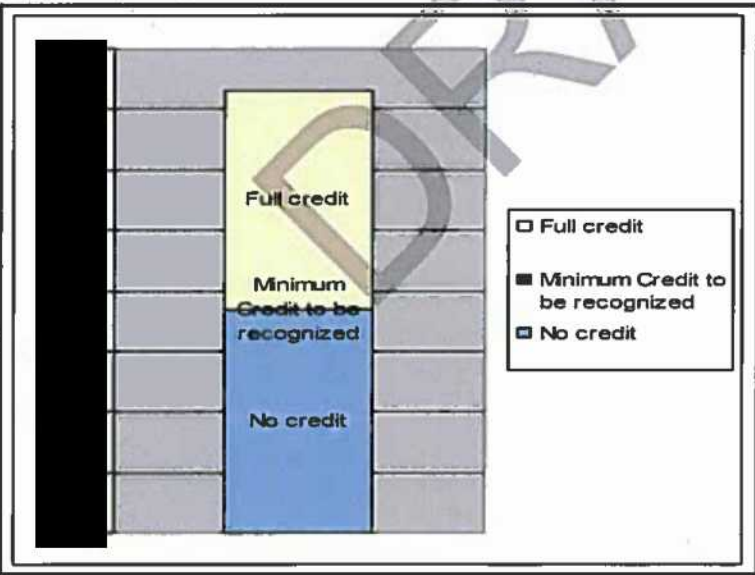
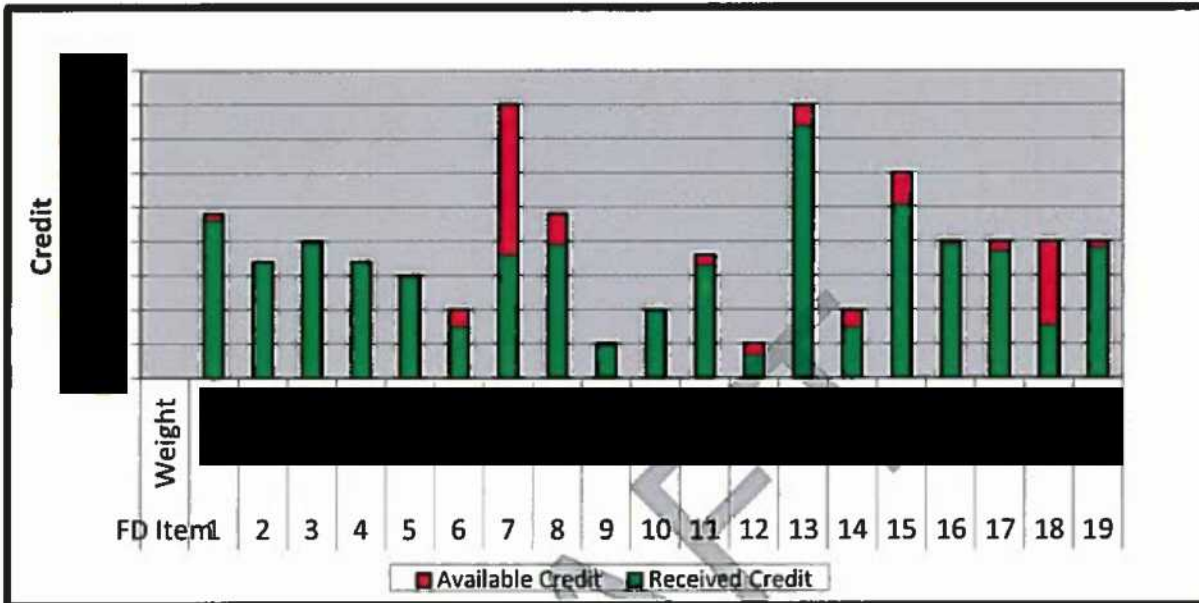


Table 7 Fire Department Grading Items Overall Summary

Grading Item	Category	Credit Received	Maximum Credit	% of FD	% of All
FD-1	Engine Service	230			
FD-2	Ladder Truck Service	170			
FD-3	Distribution of Companies and Type of Apparatus	199			
FD-4	Engine and Ladder Pump Capacity	170			
FD-5	Design, Maintenance and Condition of Apparatus	148			
FD-6	Number of Line Officers – Fire Suppression	75			
FD-7	Total Fire Force Available	180			
FD-8	Engine and Ladder Company Unit Manning	195			
FD-9	Master and Special Stream Devices	50			
FD-10	Equipment for Engines and Ladder Trucks, General	98			
FD-11	Fire Hose	165			
FD-12	Condition of Fire Hose	33			
FD-13	Training and Qualifications	369			
FD-14	Response to Alarms	74			
FD-15	Fire Ground Operations	254			
FD-16	Special Protection Required	196			
FD-17	Miscellaneous Factors and Conditions	185			
FD-18	Pre-Incident Planning	77			
FD-19	Administration	190			
[REDACTED]					
[REDACTED]					
[REDACTED]					
Weight in Grading	40			Credit Received	26.82
Relative Classification					
4					



Figure 10 Fire Department Grading Items Overall Summary



Fire Station 4 was assigned a Relative Class of 4. The figure above shows each grading item of the fire department and how much credit was received and how much credit is still available within each grading item. The relative classification contributes to the overall Public Fire Protection Classification (PFPC) of Fire District 4 and that of the entire Halifax Regional Municipality. Factoring in the Water Supply, Fire Safety Control and Emergency Communication grading items, Fire Station 4 was assigned an overall Public Fire Protection Classification of 4. In order to maintain the current level of grading the recommendations provided will need to be addressed.

Recommendations

- Close Station 4 and relocate staff to Station 3. Station 4 coverage area falls within Station 3 and 5 response areas and it is therefore redundant.



STATION 5
7090 Bayers Road



Station 5 is located at 7090 Bayers Road in Halifax and is bordered by Bayers Road to the north and east, and Ashburn Avenue to the west. The station is located in a fairly central position for response to its overall coverage area. Figure 1 shows the 2.5km, 5km and 8km coverage from Station 5.

Building and Tarmac

All fire stations should be of substantial construction, suitable for the service, and located and arranged for ease and quickness of response. Fire Station 5 is constructed of masonry with a partially concrete basement. The roof construction consists of conventional built-up roof system. The tarmac is an asphalt covered area which extends from the bay door to the street. The tarmac area is sufficient for vehicle run ups and day routines.



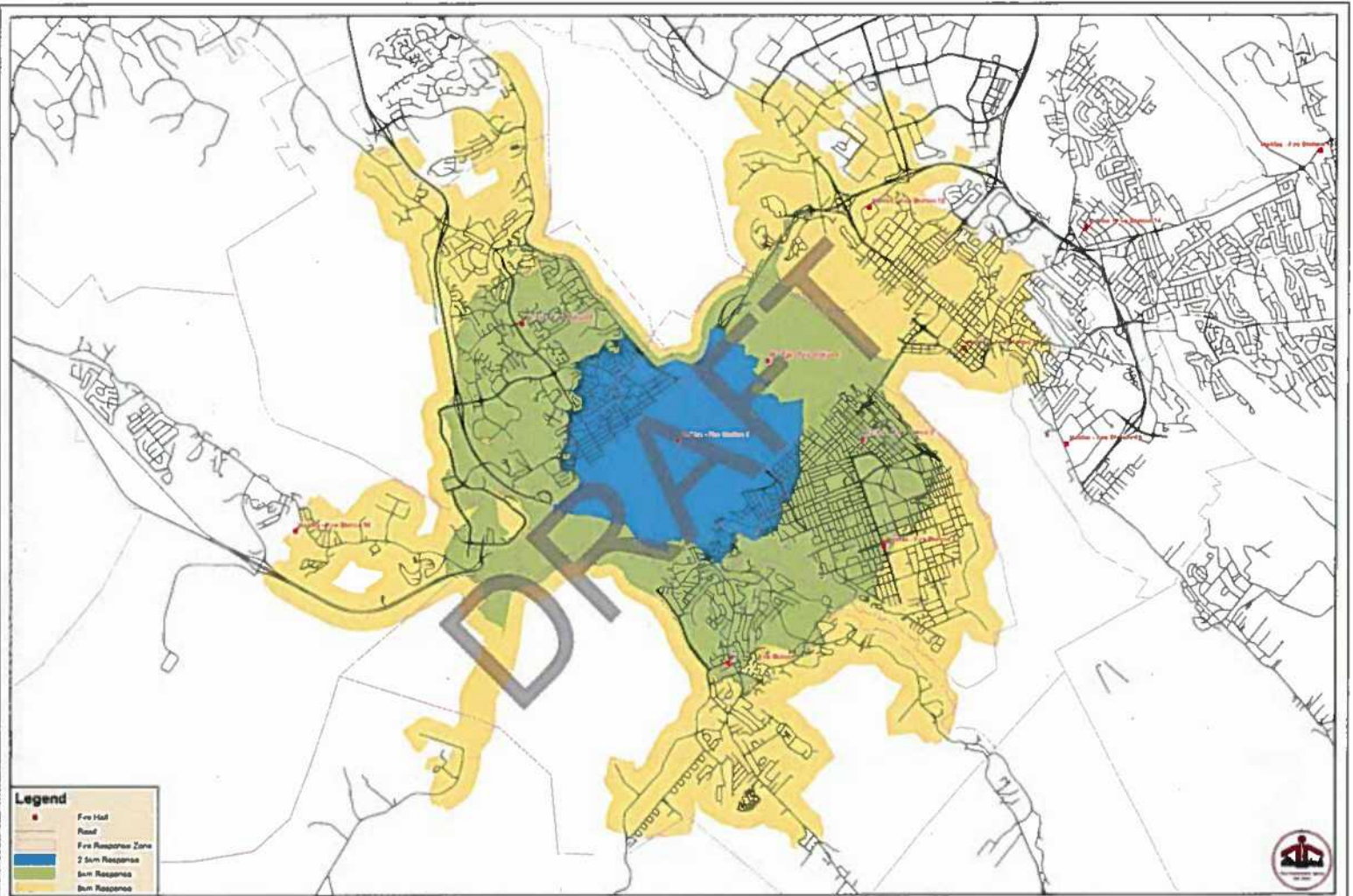


Figure 1 2.5/5km Response from Fire Station 5

Scale = 1:19,000

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. A kitchen area, sleeping quarters, a day room and a captain's office are located on the main floor of the building. Apparatus bays are also located on the main level while the basement is used as a service area and fitness area. The facilities at this station are adequate to meet the needs of the staff.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

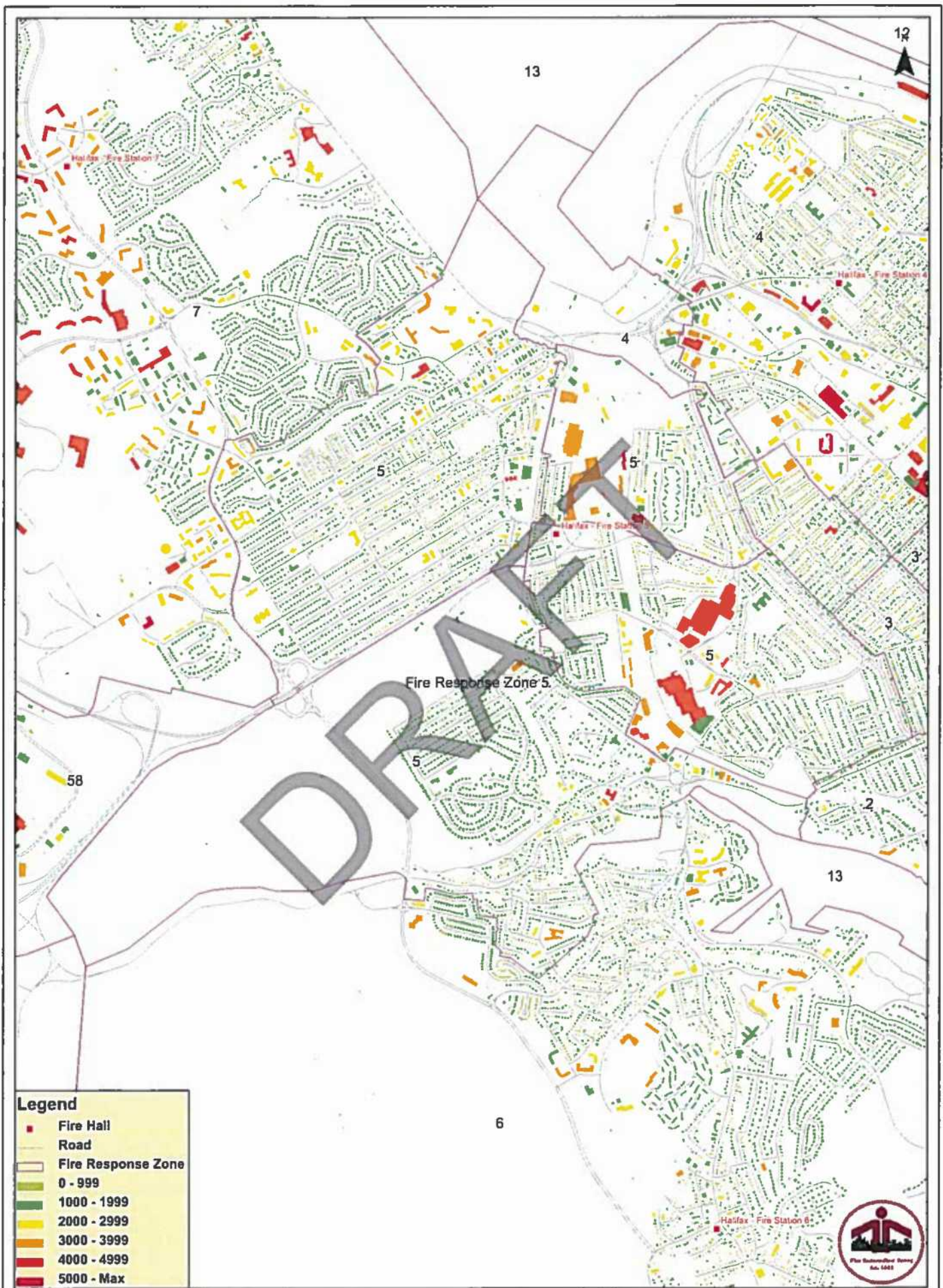
Community Risk Profile – Response Zone 5

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 5,594 Required Fire Flows were calculated for Response Zone 5 as shown in Figure 2 below. Table 1 below depicts the average Required Fire Flows calculated.

Table 1 Required Fire Flow ranges in Response Zone 5

RFF Range	No. of RFF points
0-999 IGPM	2,303
1,000-1,999 IGPM	3,149
2,000-2,999 IGPM	101
3,000-3999 IGPM	29
4,000-4,999 IGPM	11
>=5,000 IGPM	1





Legend

- Fire Hall
- Road
- Fire Response Zone
- 0 - 999
- 1000 - 1999
- 2000 - 2999
- 3000 - 3999
- 4000 - 4999
- 5000 - Max

Figure 2 Halifax Fire Response Zone 5 - Building Footprints with RFF Value

In addition the Basic Fire Flow was determined for the response area. The Basic Fire Flow is usually calculated as the 95th percentile RFF value or the 5th highest in the Fire Response Area. Considerations are given to the exposure risk, quantity of risks, and type of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response Zone 5 is based on the fifth highest which is 4,300 Imperial Gallons per Minute.

Table 2 Basic Fire Flows for HRM Response Zone 5

Total RFF Points	5,594	
	IGPM	L/s
90th Percentile	1,400	106.12
95th Percentile	1,700	128.86
Max	5,800	439.64
5th highest	4,300	325.94

Apparatus & Personnel

Standard staffing for Station 5 is a 4 person 24/7 shift. Apparatus assignment for Station 5 is one Quint.

Station 5 was evaluated for the number of Engine and Ladder companies in service relative to the overall fire potential and the area being protected. Apparatus are required to be adequately housed and staffed. Fire apparatus that serve dual purposes are evaluated based on the primary duty it serves on the fire ground. The Total Credited Engine Companies is calculated [REDACTED]

[REDACTED] The credit may be downgraded from 100 percent based on reliability factors such as age, quality, listing, pump test results and distance.

Based on the Basic Fire Flow of 4,300 IGPM, the apparatus requirements for Fire Station 5 as defined in the Fire Underwriters Survey - Table of Effective Response is as follows:

- First due Pumper Company in 2.5 minutes.
- Second due Pumper Company in 4 minutes.
- First due Ladder Company in 3.5 minutes.



The benchmark number of apparatus required is 6 Pumper companies in 7.5 minutes and 2 Ladder companies in 5 minutes. These requirements reflect the apparatus need to attain maximum credit in the Engine and Ladder items of the fire department grading and serve as a benchmark against which response is measured. Ladders received 50 percent credit as Engine apparatus and 100 percent credit as Ladder apparatus. Fire Station 5 received credit for 5 Engines out of the maximum 6 Engine companies that can be credited for grading.

Table 3 Credited in Service Engine Summary

Station #	Vehicle Type	Apparatus Credit	Engine Credit	Reserve Engine Credit
5	Quint	50% Engine Credit	0.5	0
4	Engine	100% Engine Credit	1	0
3	Ladder	50% Engine Credit	0.5	0
3	Engine	100% Engine Credit	1	0
13	Quint	50% Engine Credit	0.5	0
6	Engine	100% Engine Credit	1	0
7	Quint	50% Engine Credit	0.5	0
2	Engine	100% Engine Credit	0	1
Total Engine Credit:			5	1
Maximum Credit Receivable (4,300 l/gpm):			6	1

Response areas with five buildings that are 3 storeys or 10 m (35 ft.) or more in height, or districts that have a Basic Fire Flow greater than 3,300 IGPM, or any combination of these criteria, should have a Ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed Ladder companies for fire insurance grading to receive maximum credit. There are multiple buildings within the HRM Response Zone 5 that are three storeys or more in height. In addition several of the calculated Required Fire Flows were greater than 3,300 IGPM. Currently there is one Quint stationed at Station 5. Fire Station 5 received Primary Ladder Credit for one ladder from Station 5 and Support Ladder Credit for three ladders that would respond from Station 3, 7 and 13. The credit received for Support Ladders was downgraded based on the distance from the responding hall. Station 5 received credit for 4 Ladders out of the maximum 2 Ladder companies that can be credited for grading.



Table 4 Credited in Service Ladder Summary

Station #	Vehicle Type	Apparatus Credit	Ladder Credit	Reserve Ladder Credit
5	Quint	100% Ladder Credit	1	0
13	Quint	100% Ladder Credit	1	0
2	Ladder	100% Ladder Credit	0	1
7	Quint	100% Ladder Credit	1	0
3	Ladder	100% Ladder Credit	1	0
Total Ladder/Reserve Ladder Credit:			4	1
Maximum Credit Receivable (5,300 Igpm):			2	1

Staffing at Station 5 was evaluated in its ability to meet the staffing requirements as determined by the Basic Fire Flow benchmark from the Table of Effective Response. The total available fire force grading item is weighted heavily within the fire insurance grading of the fire department. The staffing was measured against the FUS benchmark of at least six competent career fire fighters available and assigned to respond to a fire on duty with each required Engine and Ladder Company. The number of first due (initial response) engine companies and ladder companies based on the benchmark Basic Fire Flow of 4,300 IGPM is two Engine companies and one Ladder company. The maximum credit that Station 5 can receive for initial available fire force response for two engine companies and one Ladder company is 18 fire fighters. NFPA 1710 requires each fire apparatus to be staffed with a minimum of four personnel. The current initial response from Station 5 is one Quint staffed with four fire fighters out of the maximum 18 fire fighters that can be credited.

Station Location

Station 5 is well located in Halifax. Figure 1 identifies the 2.5km, 5km and 8km coverage areas for Station 5. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.



Fire calls

The historical calls for Station 5 cover a large area of the HRM. Figure 3 shows the response of Station 5 based on its historical calls for the years 2010 to September 2013. Station 5 responded to an average of 543 calls in the 45 months. The following table is a breakdown of the calls from 2010 to September 2013. The total for 2013 reflects the emergency calls for the first 9 months of the year. Table 6 shows the breakdown of emergency calls by incident type. The year average was calculated for all calls over the 45 months.

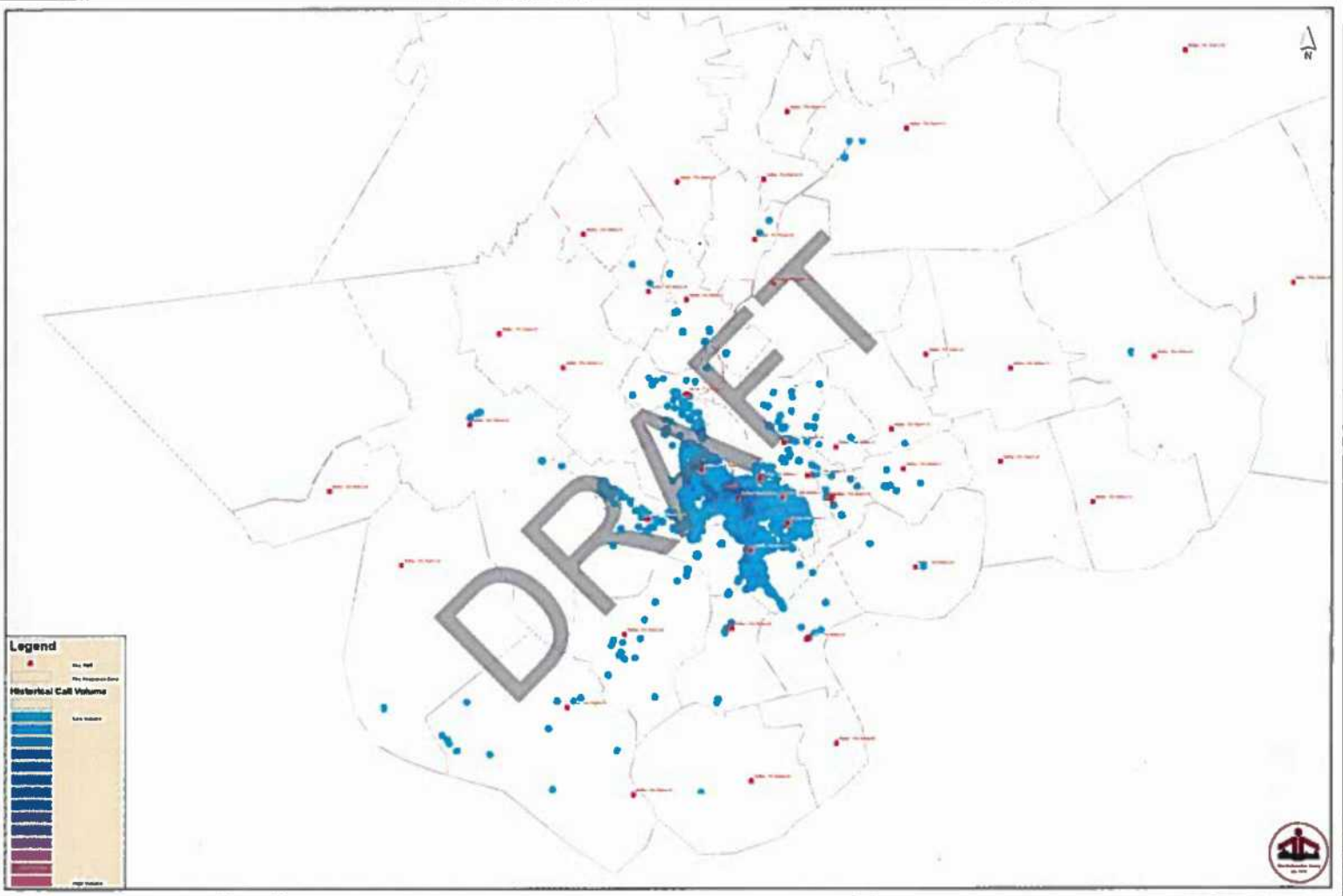
Table 5 Total Emergency calls per year

Total Calls per Year 2010 - 2013	
Year	No. of Calls
2010	618
2011	529
2012	494
2013	397

Table 6 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	228	76	11.2
False alarm	558	635	27.4
Smoke	374	149	18.4
Motor Vehicle Accident	451	80	22.1
Oil or Gas spill	22	16	1.1
Other	81	33	3.9
Rescue	4	4	0.2
Medical Assist	145	37	7.1
Coding	175	92	8.6

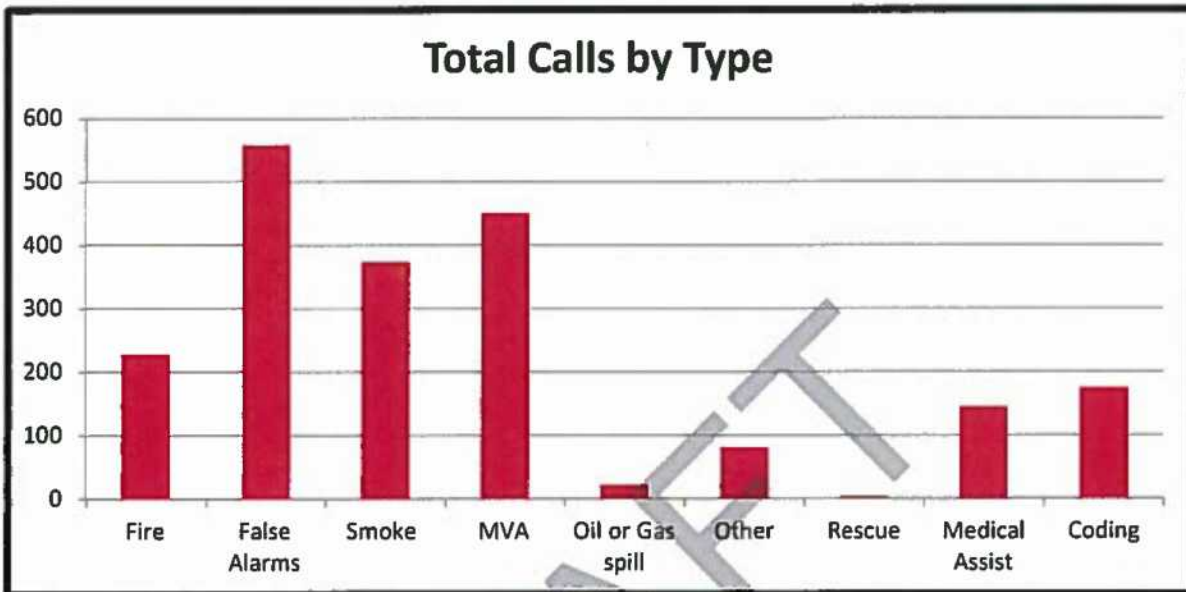




Legend

- Fire Station
- Historical Call Volume

Figure 4 Emergency Calls by Incident Type (2010-2013)



The largest percentage of calls to Station 5 was False Alarm (detectors) fire calls. Currently there is a fine applied to false alarms but it was found to be minimal. The resulting cost of time, apparatus and personnel responding to a fire alarm should be considered when determining applicable fines. The fines should be increased so as to deter false alarms and encourage building owners to maintain and repair fire alarm systems rather than pay a fine for a false alarm. There were a fewer motor vehicle accident calls however fire departments can submit their invoice for services provided as a result of an accident involving a motor vehicle or for a loss to a motor vehicle (i.e. fire) to the Province.

In reviewing the emergency call data it was noted that improvements need to be made in the call reporting procedure. HRM should implement a standard around the time stamping of fire calls and review each month for conformance with the standard and conformance with the "Service Delivery Standards for Halifax Regional Fire and Emergency" for all portions of the call listed in the service delivery standard.



Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Within the HRM Relative Classifications for Emergency Communications, Fire Prevention and Safety Control were determined and applied as a single grade across the entire city.

Relative Classifications for Fire Department and Water Supplies were calculated specifically for individual areas as follows:

- Relative Classification for each Fire District i.e. the primary geographic response zone for each fire station (52 stations in 2013).
- Relative Classification for each Major Pressure Zone (SCADA zone) (3 distribution areas in 2013).

The Fire Department Assessment contributes 40 percent to the total Public Fire Protection Classification grade. This is the most heavily weighted portion of the grading and as such is considered to be the most significant indicator of a community or municipality's overall preparedness for dealing with fire emergencies.

[REDACTED] This forms the basis of the relative classification of the Fire Department.



Figure 5 Fire Department Item Weights

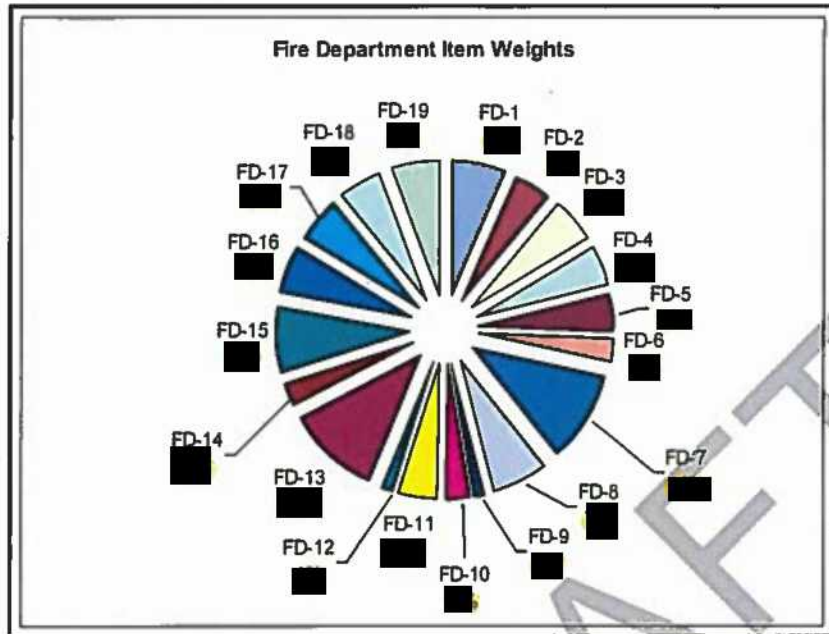


Figure 6 Fire Department Credit Points

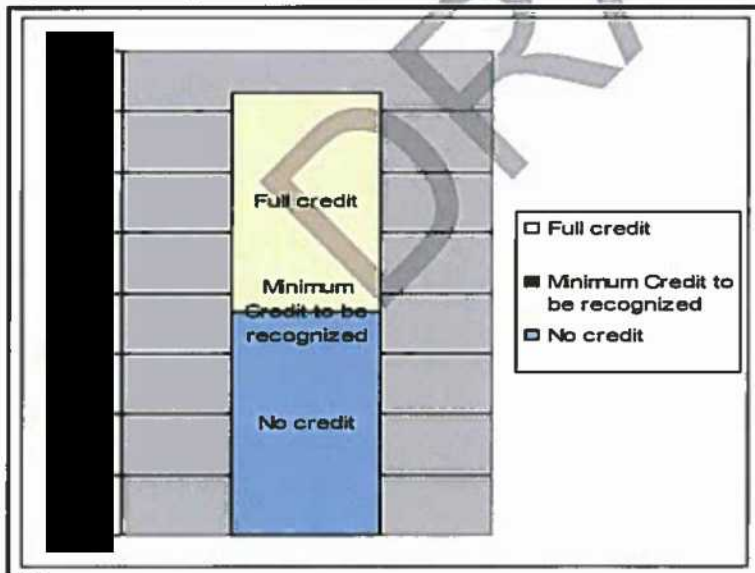
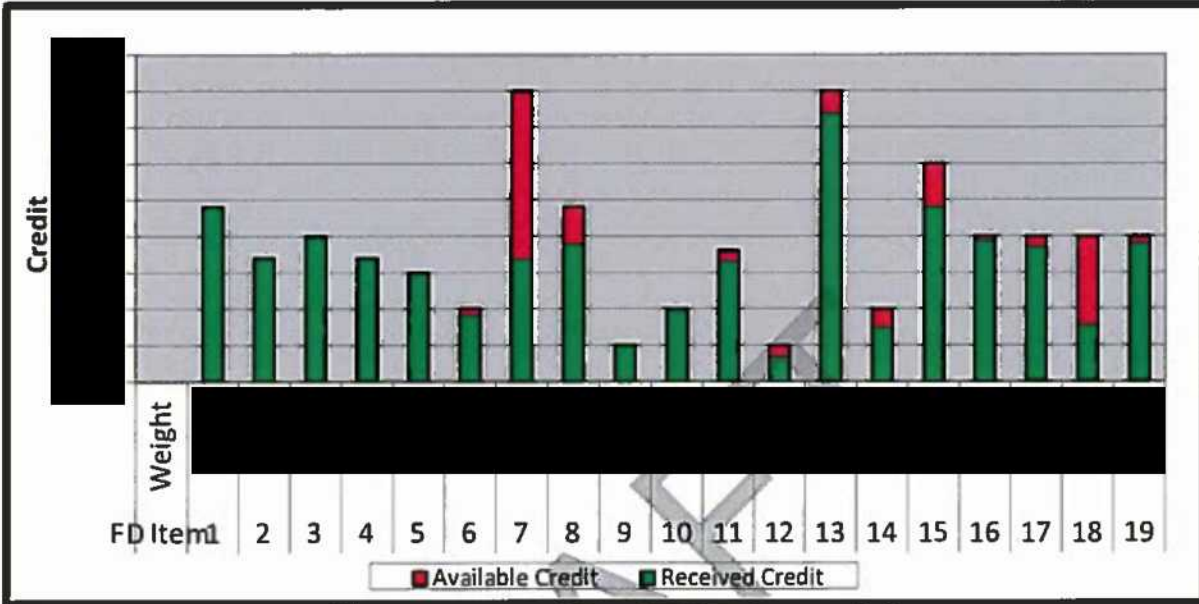


Table 7 Fire Department Grading Items Overall Summary

Grading Item	Category	Credit Received	Maximum Credit	% of FD	% of All
FD-1	Engine Service	238			
FD-2	Ladder Truck Service	170			
FD-3	Distribution of Companies and Type of Apparatus	200			
FD-4	Engine and Ladder Pump Capacity	170			
FD-5	Design, Maintenance and Condition of Apparatus	148			
FD-6	Number of Line Officers – Fire Suppression	91			
FD-7	Total Fire Force Available	168			
FD-8	Engine and Ladder Company Unit Manning	91			
FD-9	Master and Special Stream Devices	50			
FD-10	Equipment for Engines and Ladder Trucks, General	98			
FD-11	Fire Hose	165			
FD-12	Condition of Fire Hose	33			
FD-13	Training and Qualifications	369			
FD-14	Response to Alarms	74			
FD-15	Fire Ground Operations	240			
FD-16	Special Protection Required	194			
FD-17	Miscellaneous Factors and Conditions	185			
FD-18	Pre-Incident Planning	77			
FD-19	Administration	190			
[REDACTED]					
[REDACTED]					
[REDACTED]					
Weight in Grading	40			Credit Received	26.68
Relative Classification					
4					



Figure 7 Fire Department Grading Items Overall Summary



Fire Station 5 was assigned a Relative Class of 4. The figure above shows each grading item of the fire department and how much credit was received and how much credit is still available within each grading item. The relative classification contributes to the overall Public Fire Protection Classification (PFPC) of Fire District 5 and that of the entire Halifax Regional Municipality. Factoring in the Water Supply, Fire Safety Control and Emergency Communications grading items, Fire Station 5 was assigned an overall Public Fire Protection Classification of 4. This indicates that the level of response is proportionate to the level of risk in the fire protection district.

Maintaining the Public Fire Protection Classification for Station 5 will ensure residents within the fire protection area receive the full benefit of available property insurance premium discounts based on the level of fire protection provided. If Station 5 is downgraded to a PFPC 5 the resulting cost to the tax payer in the form of insurance costs would be approximately \$3,000,000.00 for the zone as shown in Table 8 below. These values are estimates only as insurance rates are dynamic and dependent on a large number of factors. A further point to consider is that as the PFPC decreases in value, i.e. going from PFPC 5 to PFPC 4 the capacity of an insurer to underwrite in the City can change and in turn can create



competition which may lower rates. It is difficult to quantify the true effects and figures given here are estimates.

Table 8 Premium Estimates under the Public Fire Protection Classification System – Response Zone 5

Public Fire Protection Classification	Total Premium Estimates Prior to FUS Study	Total Premium Estimates Post FUS Study	Total Premium Estimates Difference
3	\$4,739,534		
4		\$5,118,696	\$379,162
5		\$7,820,231	\$3,080,697

Recommendations

- No recommendations regarding apparatus and staffing are made for Station 5.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 6
245 Herring Cove Road

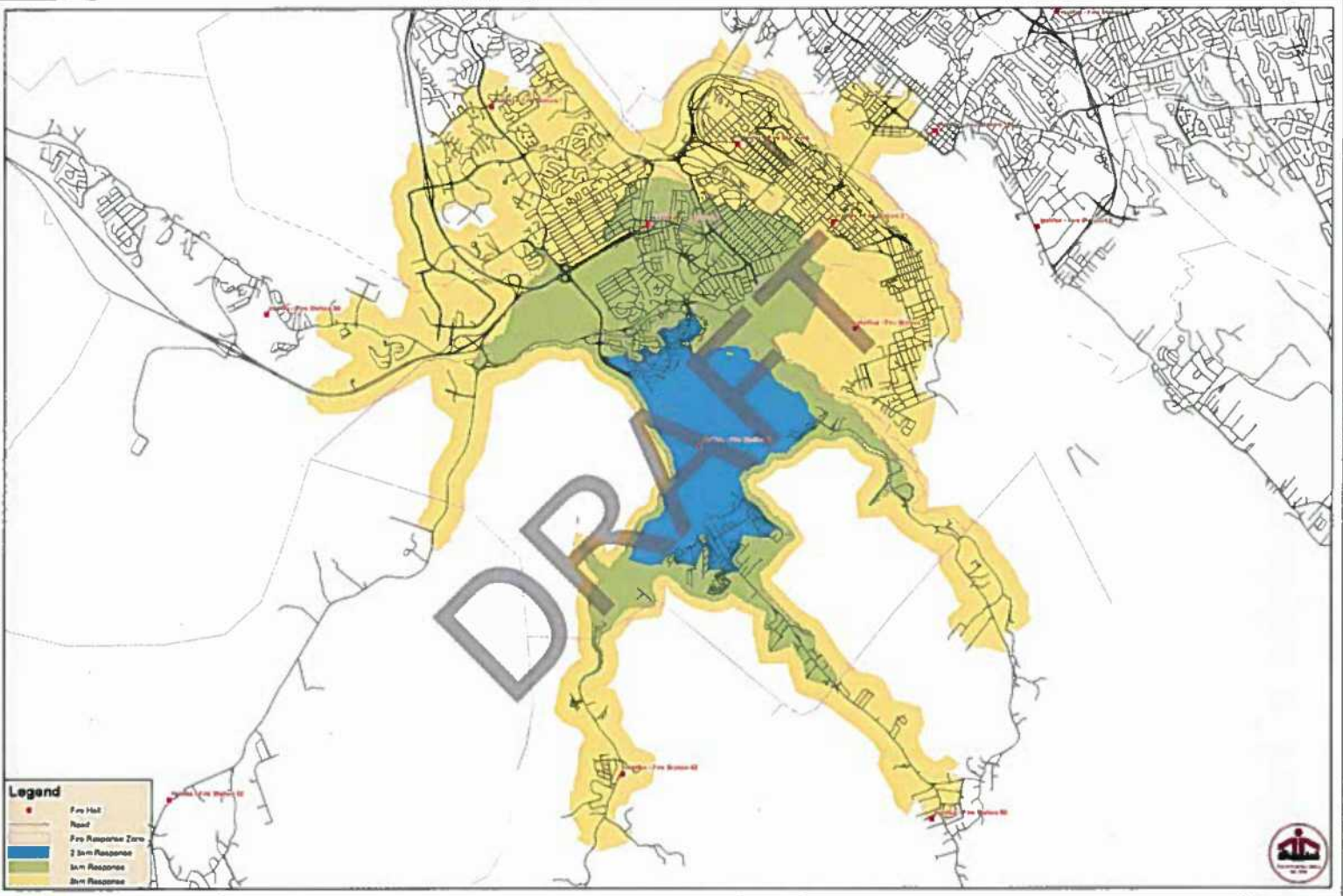


Station 6 is located at 245 Herring Cove Road in Halifax and is bordered by Herring Cove Road to the east and Old Sambro Road to the north. The station is located in a fairly central position for response to its overall coverage area. Figure 1 shows the 2.5km, 5km and 8km coverage from Station 6.

Building and Tarmac

All fire stations should be of substantial construction, suitable for the service, and located and arranged for ease and quickness of response. Fire Station 6 is constructed of concrete block and steel with a brick veneer exterior cladding. The roof is wood framed with a modified bitumen membrane covering. The tarmac is an asphalt covered area which extends from the bay door to the street. The tarmac area is sufficient for vehicle run ups and day routines.





Legend

- Fire Station
- Road
- Fire Response Zone
- 2 km Response
- 5 km Response
- 5km Response



Regional Municipality of Halifax

Figure 1.2 5/5km Response from Fire Station 5
 Scale = 1:10,000



Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. A kitchen area, sleeping quarters, a day room and a captain's office are located on the main floor of the building. Apparatus bays are located on adjacent to the main building. The facilities at this station are adequate to meet the needs of the staff.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

Community Risk Profile – Response Zone 6

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 5,829 Required Fire Flows were calculated for Response Zone 6 as shown in Figure 2 below. Table 1 below depicts the average Required Fire Flows calculated.

Table 1 Required Fire Flow ranges in Response Zone 6

RFF Range	No. of RFF points
0-999 IGPM	2,183
1000-1999 IGPM	3,512
2000-2999 IGPM	106
3000-3999 IGPM	22
4000-4999 IGPM	5
>=5000 IGPM	1



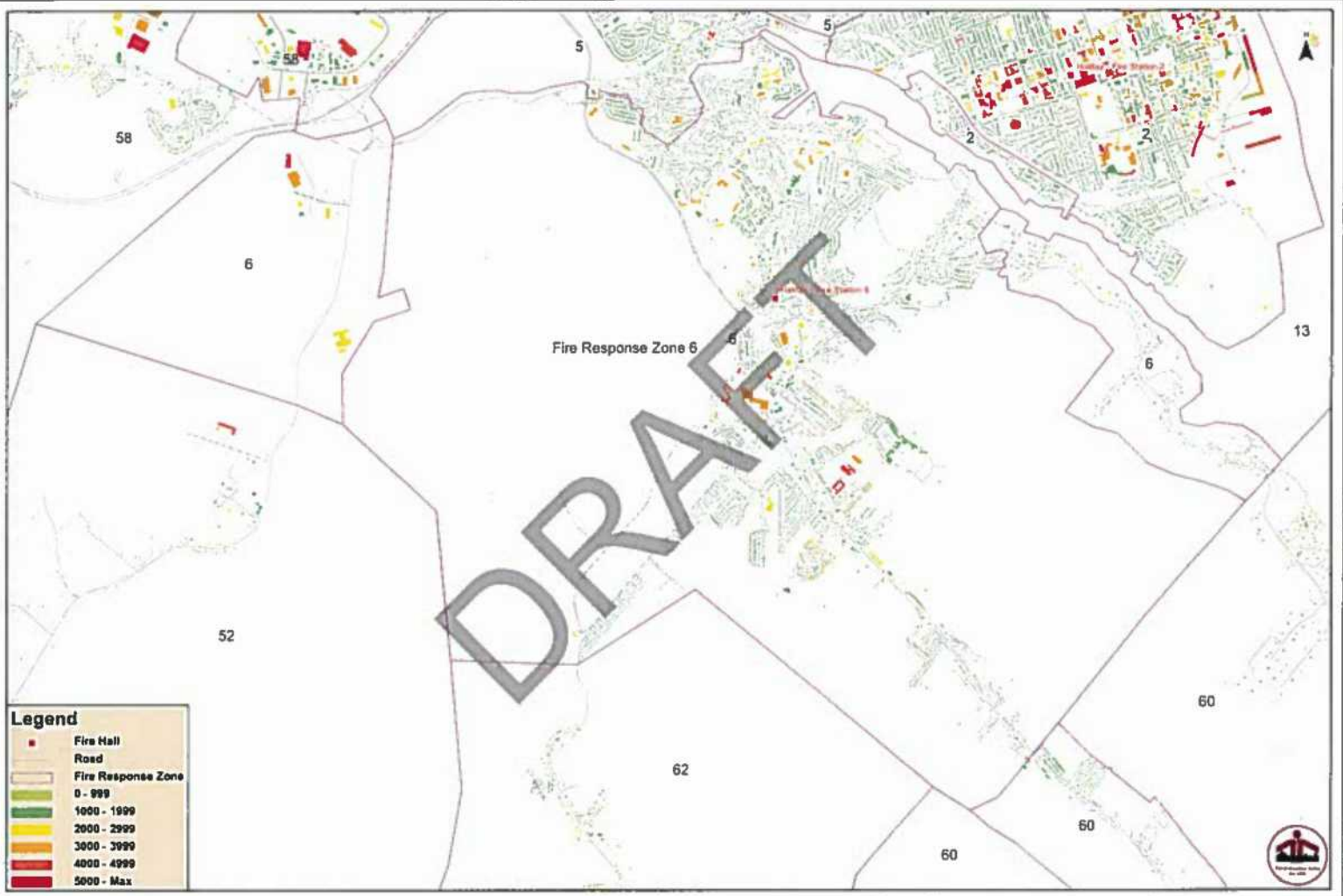


Figure 2 Halifax Fire Response Zone 6 - Building Footprints with RFF Value

In addition the Basic Fire Flow was determined for the response area. The Basic Fire Flow is usually calculated as the 95th percentile RFF value or the 5th highest in the Fire Response Area. Considerations are given to the exposure risk, quantity of risks, and type of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response Zone 6 is based on the 95th percentile which is 1,500 Imperial Gallons per Minute.

Table 2 Basic Fire Flows for HRM Response Zone 6

Total RFF Points	5,829	
	IGPM	L/s
90th Percentile	1,400	106.12
95th Percentile	1,500	128.86
Max	5,300	439.64
5th highest	4,000	325.94

Apparatus & Personnel

Standard staffing for Station 6 is a 4 person 24/7 shift. Apparatus assignment for Station 6 is one Engine.

Station 6 was evaluated for the number of Engine and Ladder companies in service relative to the overall fire potential and the area being protected. Apparatus are required to be adequately housed and staffed. Fire apparatus that serve dual purposes are evaluated based on the primary duty it serves on the fire ground. The Total Credited Engine Companies is calculated by [REDACTED]

[REDACTED] The credit may be downgraded from 100 percent based on reliability factors such as age, quality, listing, pump test results and distance.

Based on the Basic Fire Flow of 1,500 IGPM, the apparatus requirements for Fire Station 6 as defined in the Fire Underwriters Survey - Table of Effective Response is as follows:

- First due Pumper Company in 3.5 minutes.
- Second due Pumper Company in 5 minutes.



- First due Ladder Company in 4 minutes.

The benchmark number of apparatus required is 2 Pumper companies in 5 minutes and 1 Ladder company in 4 minutes. These requirements reflect the apparatus need to attain maximum credit in the Engine and Ladder items of the fire department grading and serve as a benchmark against which response is measured. Ladders received 50 percent credit as Engine apparatus and 100 percent credit as Ladder apparatus. Fire Station 6 received credit for 2.62 Engines out of the maximum 2 Engine companies that can be credited for grading.

Table 3 Credited in Service Engine Summary

Station #	Vehicle Type	Apparatus Credit	Engine Credit	Reserve Engine Credit
6	Engine	100% Engine Credit	1	0
5	Quint	47% Engine Credit	0.47	0
3	Ladder	65% Engine Credit	0.50	0
3	Engine	65% Engine Credit	0.65	0
2	Ladder	50% Reserve Credit	0	0.5
2	Engine	100% Reserve Credit	0	1
Total Engine Credit:			2.62	1.5
Maximum Credit Receivable (1,500 lpgm):			2	1

Response areas with five buildings that are 3 storeys or 10 m (35 ft.) or more in height, or districts that have a Basic Fire Flow greater than 3,300 IGPM, or any combination of these criteria, should have a Ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed Ladder companies for fire insurance grading to receive maximum credit. There are multiple buildings within the HRM Response Zone 6 that are three storeys or more in height. In addition several of the calculated Required Fire Flows were greater than 3,300 IGPM. Currently there is no Ladder stationed at Station 6. Fire Station 6 received Support Ladder Credit for one Quint from Station 5. The credit received for Support Ladders was downgraded based on the distance from the responding hall. Station 6 received credit for 1 Ladder out of the maximum 1 Ladder companies that can be credited for grading.



Table 4 Credited in Service Ladder Summary

Station #	Vehicle Type	Apparatus Credit	Ladder Credit	Reserve Ladder Credit
5	Quint	100% Ladder Credit	1	0
2	Ladder	100% Ladder Credit	0	1
Total Ladder/Reserve Ladder Credit:			1	1
Maximum Credit Receivable (1,500 Igpm):			1	1

Staffing at Station 6 was evaluated in its ability to meet the staffing requirements as determined by the Basic Fire Flow benchmark from the Table of Effective Response. The total available fire force grading item is weighted heavily within the fire insurance grading of the fire department. The staffing was measured against the FUS benchmark of at least six competent career fire fighters available and assigned to respond to fire for duty with each required Engine and Ladder Company. The number of first due (initial response) engine companies and ladder companies based on the benchmark Basic Fire Flow of 1,500 IGPM is two Engine companies and one Ladder company. The maximum credit that Station 6 can receive for initial available fire force response for two engine companies and one Ladder company is 18 fire fighters. NFPA 1710 requires each fire apparatus to be staffed with a minimum of four personnel. The current initial response from Station 6 is one Engine staffed with four fire fighters. The station was therefore credited with four fire fighters available for initial response out of the maximum 18 fire fighters that can be credited.

Station Location

Station 6 is well located for response. Figure 1 identifies the 2.5km, 5km and 8km coverage areas for Station 6. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows within fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.



Fire calls

The historical calls for Station 6 cover a large area of the HRM. Figure 3 shows the response of Station 6 based on its historical calls for the years 2010 to September 2013. Station 6 responded to an average of 458 calls in the 45 months reviewed. Table 5 is a breakdown of the calls from 2010 to September 2013. The total for 2013 reflects the emergency calls for the first 9 months of the year. Table 6 shows the breakdown of emergency calls by incident type. The year average was calculated for all calls over the 45 months.

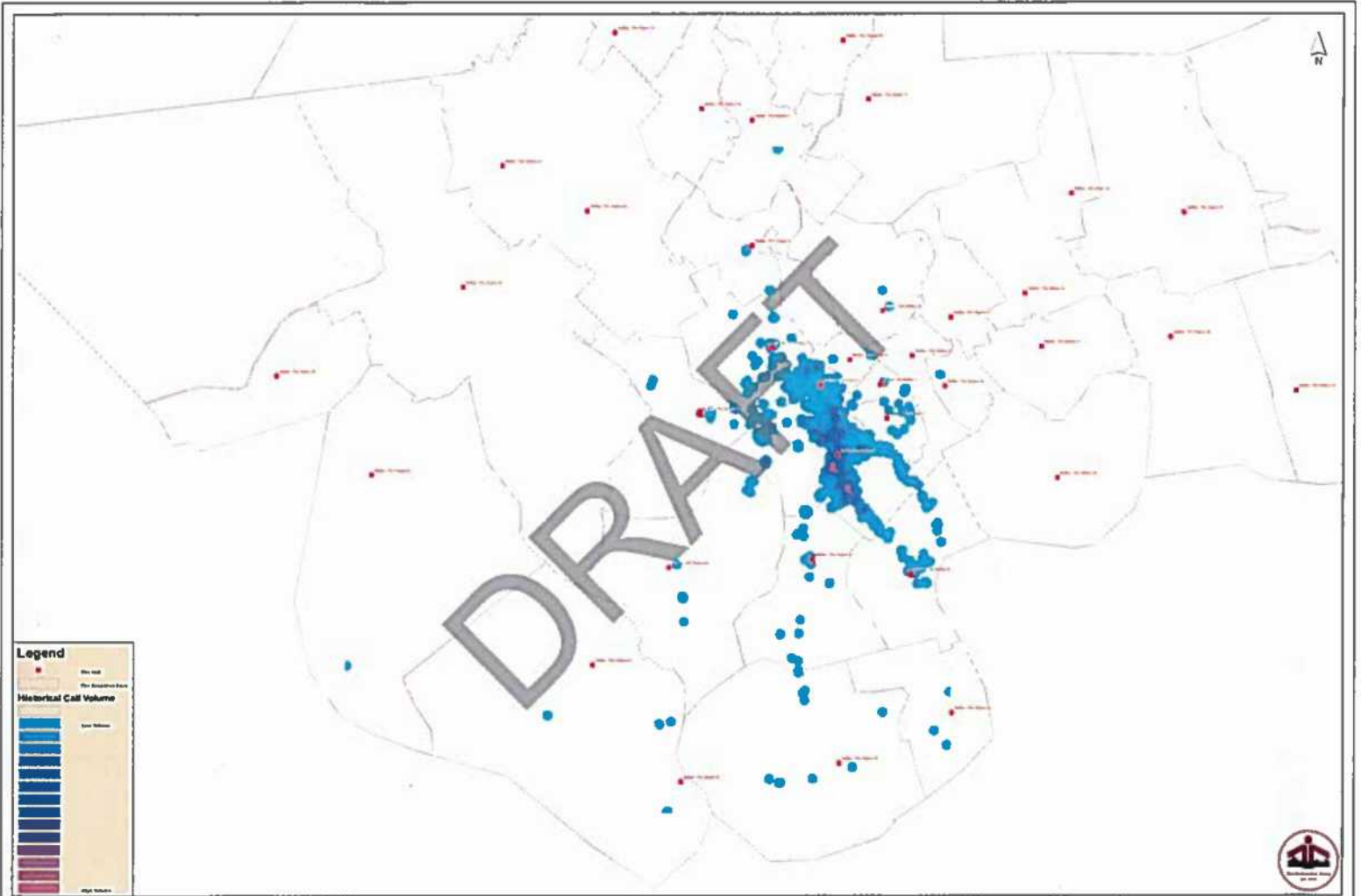
Table 5 Total Emergency calls per year

Total Calls per Year 2010 - 2013	
Year	No. of Calls
2010	515
2011	442
2012	454
2013	306

Table 6 Emergency calls by Incident Type

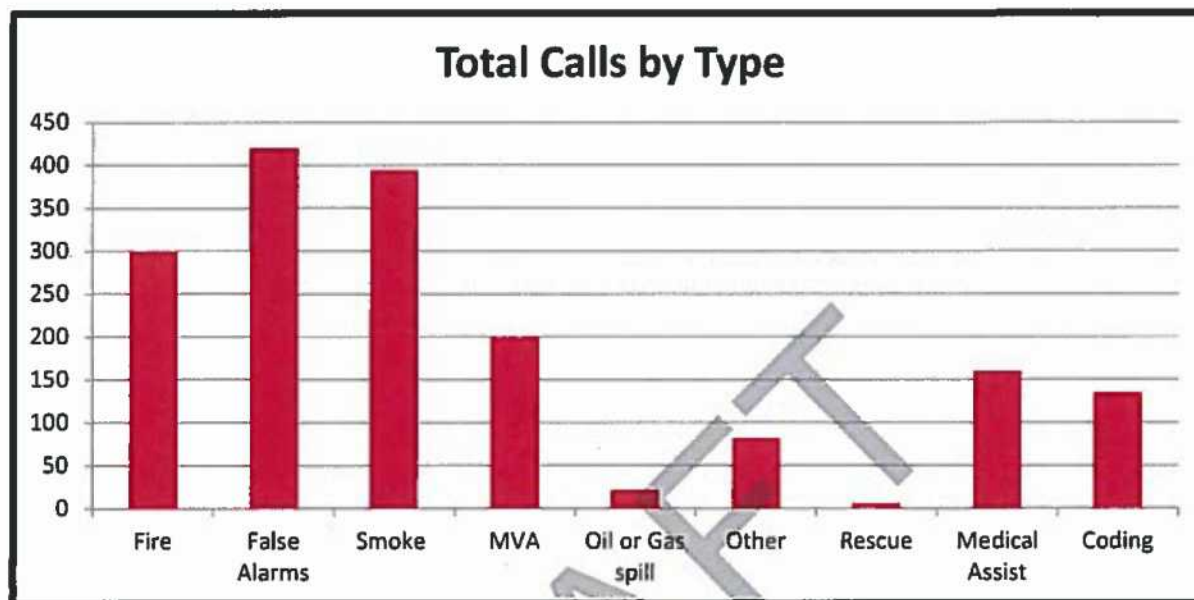
Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	299	80	17.4
False alarm	420	112	24.5
Smoke	394	105	22.9
Motor Vehicle Accident	199	53	11.6
Oil or Gas spill	22	6	1.3
Other	82	22	4.8
Rescue	6	1.6	0.3
Medical Assist	160	43	9.3
Coding	135	36	7.9





DRAFT

Figure 4 Emergency Calls by Incident Type (2010-2013)



The largest percentage of calls to Station 6 was False Alarm (detectors) fire calls. Currently there is a fine applied to false alarms but it was found to be minimal. The resulting cost of time, apparatus and personnel responding to a fire alarm should be considered when determining applicable fines. The fines should be increased so as to deter false alarms and encourage building owners to maintain and repair fire alarm systems rather than pay a fine for a false alarm. There were several motor vehicle accident calls to Station 6. Fire departments should submit their invoice for services provided as a result of an accident involving a motor vehicle or for a loss to a motor vehicle (i.e. fire) to the Province.

In reviewing the emergency call data it was noted that improvements need to be made in the call reporting procedure. HRM should implement a standard around the time stamping of fire calls and review each month for conformance with the standard and conformance with the "Service Delivery Standards for Halifax Regional Fire and Emergency" for all portions of the call listed in the service delivery standard.



Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Within the HRM Relative Classifications for Emergency Communications, Fire Prevention and Safety Control were determined and applied as a single grade across the entire city.

Relative Classifications for Fire Department and Water Supplies were calculated specifically for individual areas as follows:

- Relative Classification for each Fire District i.e. the primary geographic response zone for each fire station (52 stations in 2013).
- Relative Classification for each Major Pressure Zone (SCADA zone) (3 distribution areas in 2013).

The Fire Department Assessment contributes 40 percent to the total Public Fire Protection Classification grade. This is the most heavily weighted portion of the grading and as such is considered to be the most significant indicator of a community or municipality's overall preparedness for dealing with fire emergencies.

[REDACTED] This forms the basis of the relative classification of the Fire Department.



Figure 5 Fire Department Item Weights

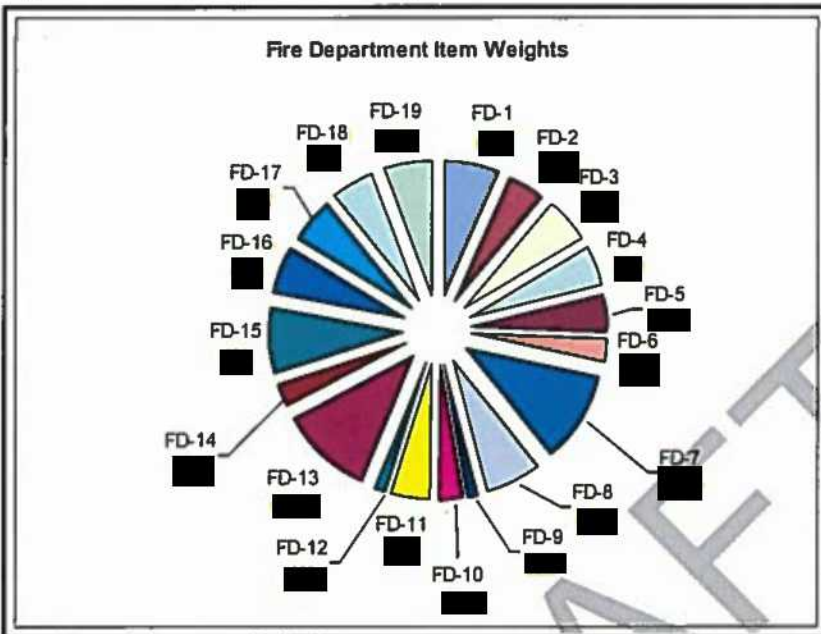


Figure 6 Fire Department Credit Points

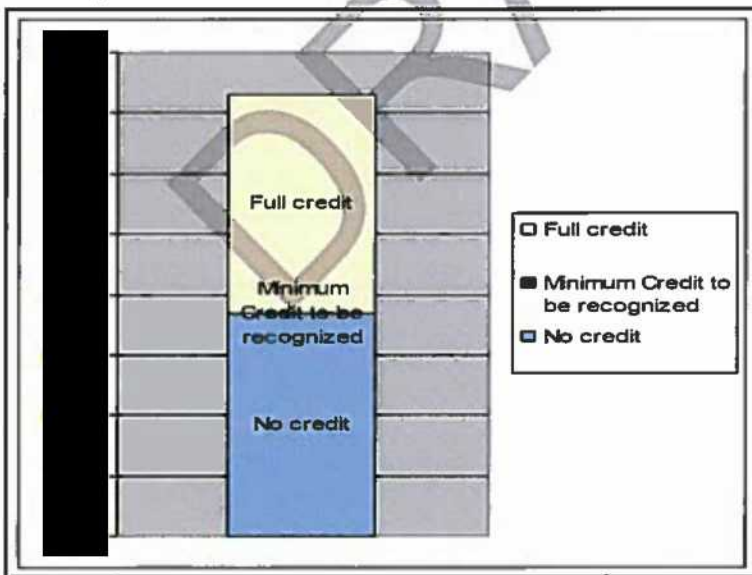
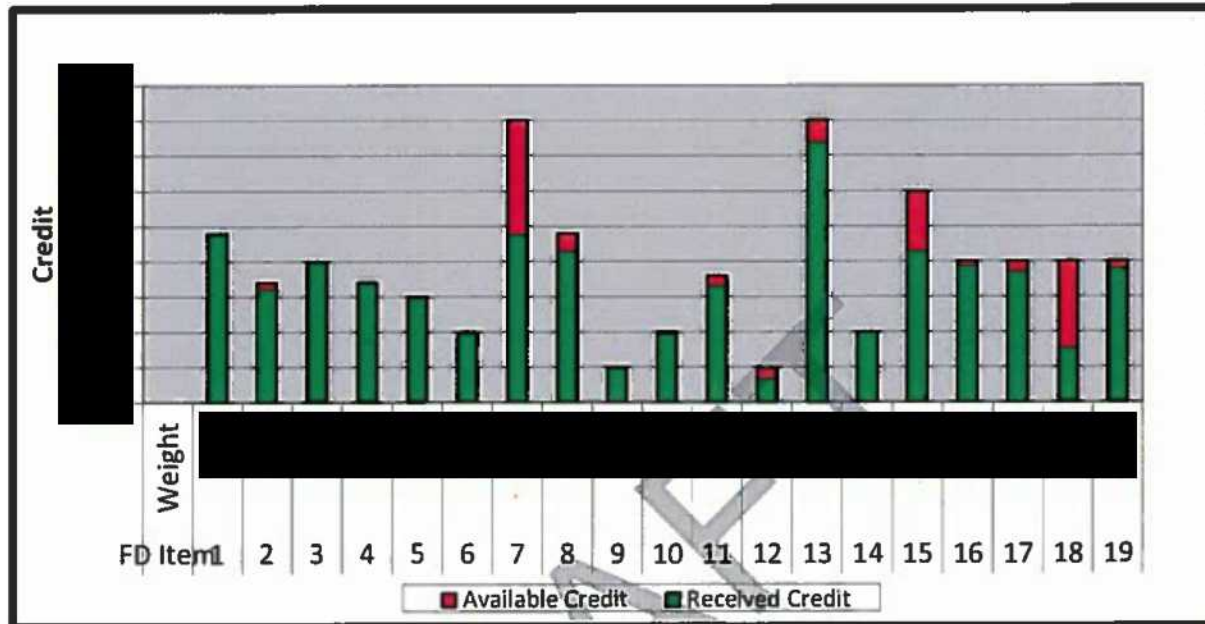


Table 7 Fire Department Grading Items Overall Summary

Grading Item	Category	Credit Received	Maximum Credit	% of FD	% of All
FD-1	Engine Service	240			
FD-2	Ladder Truck Service	161			
FD-3	Distribution of Companies and Type of Apparatus	198			
FD-4	Engine and Ladder Pump Capacity	170			
FD-5	Design, Maintenance and Condition of Apparatus	148			
FD-6	Number of Line Officers – Fire Suppression	100			
FD-7	Total Fire Force Available	238			
FD-8	Engine and Ladder Company Unit Manning	215			
FD-9	Master and Special Stream Devices	50			
FD-10	Equipment for Engines and Ladder Trucks, General	98			
FD-11	Fire Hose	165			
FD-12	Condition of Fire Hose	33			
FD-13	Training and Qualifications	369			
FD-14	Response to Alarms	100			
FD-15	Fire Ground Operations	215			
FD-16	Special Protection Required	194			
FD-17	Miscellaneous Factors and Conditions	185			
FD-18	Pre-Incident Planning	77			
FD-19	Administration	190			
[Redacted]					
[Redacted]					
[Redacted]					
Weight in Grading	40			Credit Received	28.76
Relative Classification					
3					



Figure 7 Fire Department Grading Items Overall Summary



Fire Station 6 was assigned a Relative Glass of 3. The figure above shows each grading item of the fire department and how much credit was received and how much credit is still available within each grading item. The relative classification contributes to the overall Public Fire Protection Classification (PFPC) of Fire District 6 and that of the entire Halifax Regional Municipality. Factoring in the water supply, fire safety control and emergency grading items, Fire Station 6 was assigned an overall Public Fire Protection Classification of 4. This indicates that the level of response is proportionate to the level of risk in the fire protection district.

Maintaining the Public Fire Protection Classification for Station 6 will ensure residents within the fire protection area receive the full benefit of available property insurance premium discounts based on the level of fire protection provided. In the event the Station 6 is downgraded the resulting cost to the tax payer in the form of insurance costs would be approximately \$800,000.00 in insurance premium increases for the zone. These values are estimates only as insurance rates are dynamic and dependent on a large number of factors. A further point to consider is that as the PFPC decreases in value, i.e. going from PFPC 5 to PFPC 4 the capacity of an insurer to underwrite in the City can change and in turn can



create competition which can lower rates. It is difficult to quantify the true effects and figures given here are estimates.

Table 8 Premium Estimates under the Public Fire Protection Classification System – Response Zone 6

Public Fire Protection Classification	Total Premium Estimates Prior to FUS Study	Total Premium Estimates Post FUS Study	Total Premium Estimates Difference
2	\$1,245,740		
4		\$1,345,399	\$99,659
5		\$2,055,471	\$809,731

Recommendations

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



STATION 7
45 Knightsridge Drive

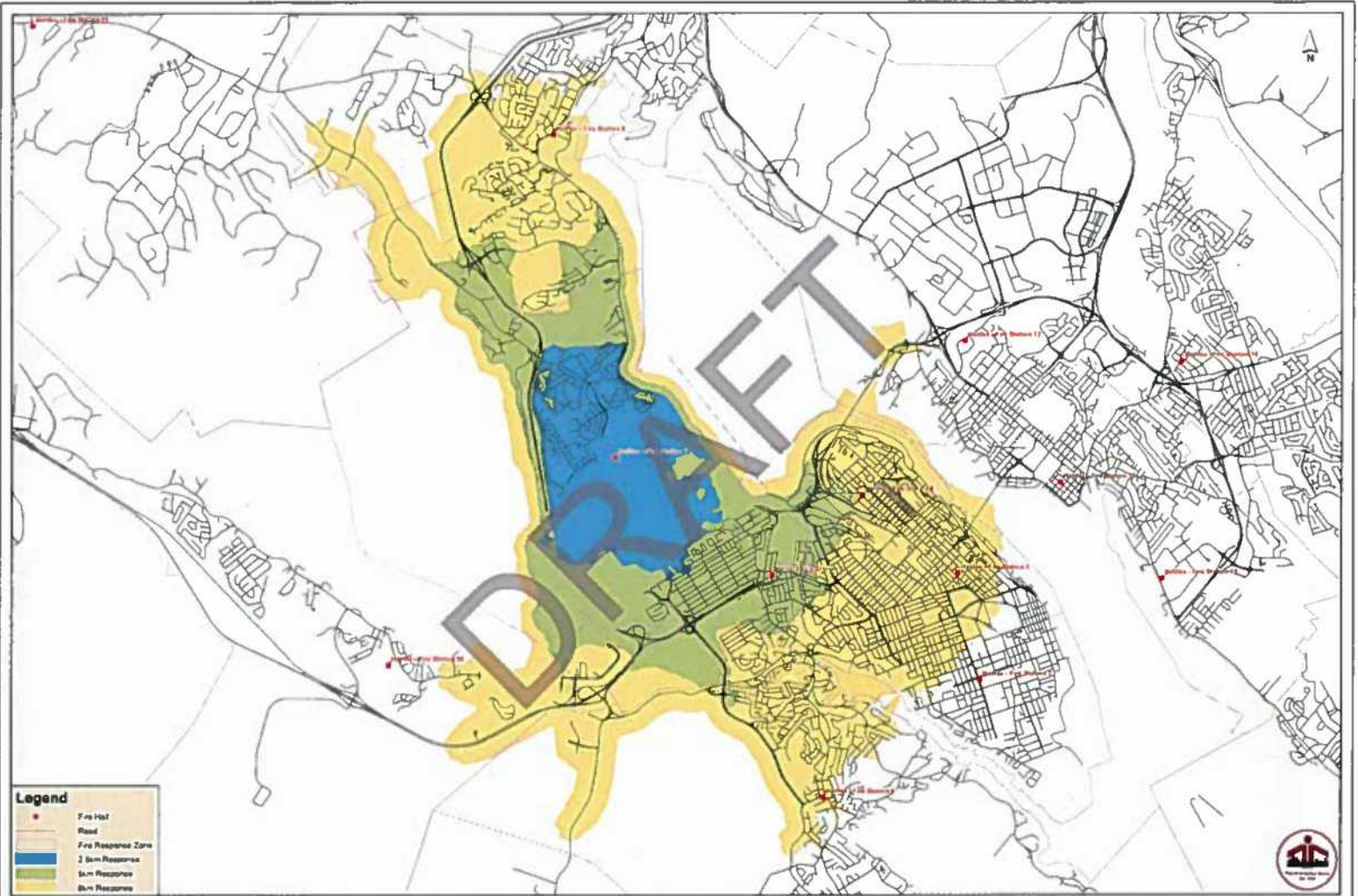


Station 7 is located at 45 Knightsridge Drive in Halifax, and is bordered by Knightsridge Drive to the north. The station is located in a fairly central position for response to its overall coverage area. Figure 1 shows the 2.5 km, 5 km and 8 km coverage from Station 7.

Building and Tarmac

All fire stations should be of substantial construction, suitable for the service, and located and arranged for ease and quickness of response. Fire Station 7 is constructed of concrete block and steel with a brick veneer exterior cladding. The roof consists of engineered wood trusses. The tarmac is an asphalt covered area which extends from the bay door to the street. The tarmac area is sufficient for vehicle run ups and day routines.





Legend

- Fire Station
- Road
- Fire Response Zone
- 1 km Response
- 5 km Response
- 8 km Response

Figure 1 2 55/8km Response from Fire Station 7

Scale = 1:10,000

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. A kitchen area, sleeping quarters, a day room and a captain's office are located on the main floor of the building. Apparatus bays are located on adjacent to the main building. In addition the fire department training facilities are located at this station. These consist of a large open area of asphalt pavement, a training building for classroom work and storage, a wood tower to simulate apartment fires, buildings to simulate entrance through roofs and other props and equipment. The facilities at this station are adequate to meet the needs of the staff.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

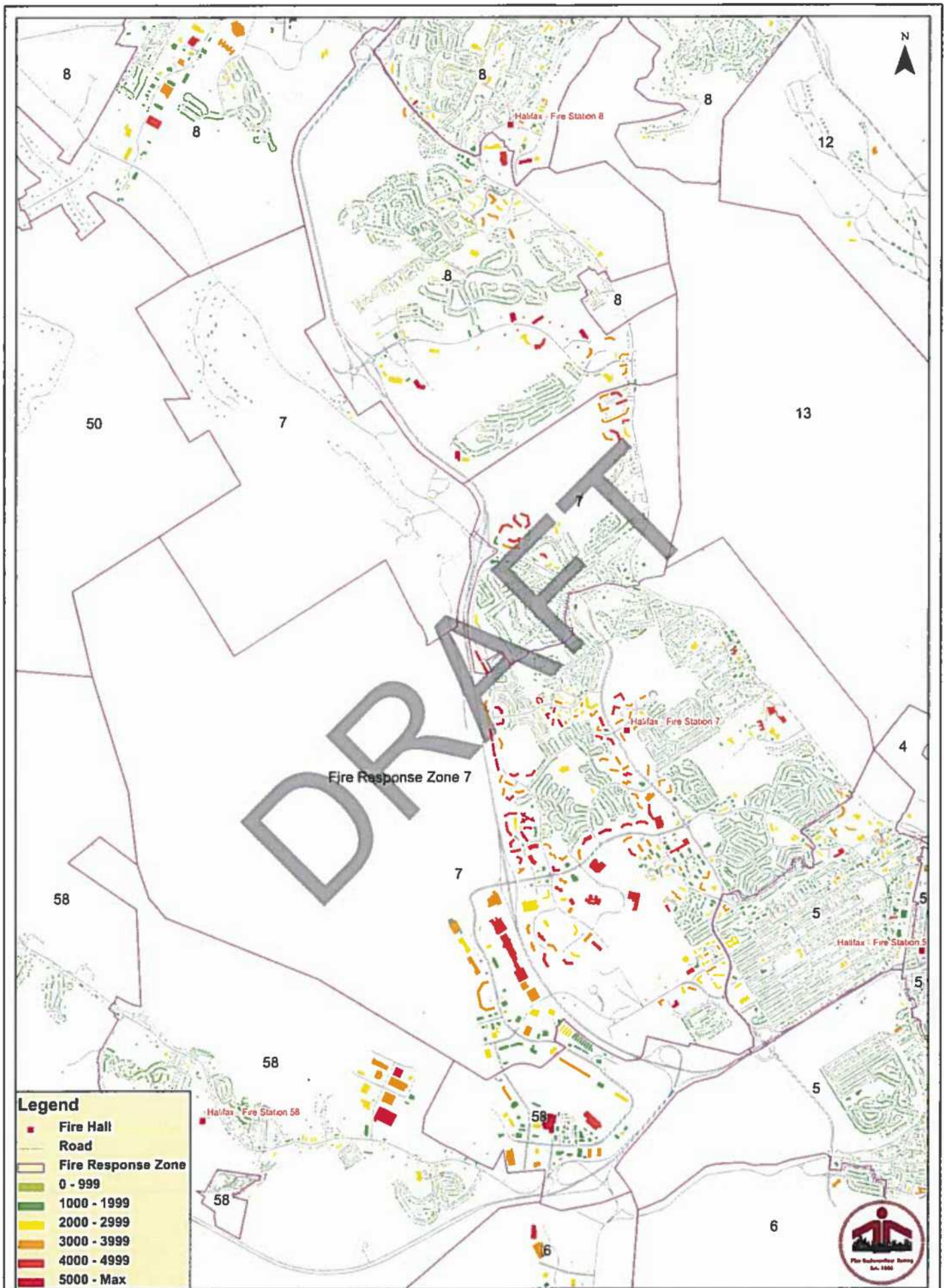
Community Risk Profile – Response Zone 7

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 4,503 Required Fire Flows were calculated for Response Zone 7 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 7

RFF Range	No. of RFF points
0-999 IGPM	686
1,000-1,999 IGPM	3,567
2,000-2,999 IGPM	113
3,000-3,999 IGPM	71
4,000-4,999 IGPM	53
$\geq 5,000$ IGPM	13





In addition the Basic Fire Flow was determined for the response area. The Basic Fire Flow is usually calculated as the 95th percentile RFF value or the 5th highest in the Fire Response Area. Considerations are given to the exposure risk, quantity of risks, and type of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response Zone 7 is based on the 5th highest which is 5,800 Imperial Gallons per Minute.

Table 2 Basic Fire Flows for HRM Response Zone 7

Total RFF Points	4,503	
	IGPM	L/s
90th Percentile	1,500	113.70
95th Percentile	2,100	159.18
Max	6,600	500.28
5th highest	5,800	439.64

Apparatus & Personnel

Standard staffing for Station 7 is a 4 person 24/7 shift. Apparatus assignment for Station 7 is one Quint.

Station 7 was evaluated for the number of Engine and Ladder companies in service relative to the overall fire potential and the area being protected. Apparatus are required to be adequately housed and staffed. Fire apparatus that serve dual purposes are evaluated based on the primary duty it serves on the fire ground. The Total Credited Engine Companies is [REDACTED]

[REDACTED] The credit may be downgraded from 100 percent based on reliability factors such as age, quality, listing, pump test results and distance.

Based on the Basic Fire Flow of 5,800 IGPM, the apparatus requirements for Fire Station 7 as defined in the Fire Underwriters Survey - Table of Effective Response is as follows:

- First due Pumper Company in 2.5 minutes.
- Second due Pumper Company in 4 minutes.
- First due Ladder Company in 3.5 minutes.



The benchmark number of apparatus required is 7 Pumper companies in 7.5 minutes and 2 Ladder companies in 5 minutes. These requirements reflect the apparatus need to attain maximum credit in the Engine and Ladder items of the fire department grading and serve as a benchmark against which response is measured. Ladders received 50 percent credit as Engine apparatus and 100 percent credit as Ladder apparatus. Fire Station 7 received credit for 4.67 Engines out of the maximum 7 Engine companies that can be credited for grading.

Table 3 Credited in Service Engine Summary

Station #	Vehicle Type	Apparatus Credit	Engine Credit	Reserve Engine Credit
7	Quint	50% Engine Credit	0.5	0
5	Quint	37% Engine Credit	0.37	0
4	Engine	100% Engine Credit	1	0
8	Engine	96% Engine Credit	0.96	0
8	Engine	96% Engine Credit	0.96	0
3	Engine	88% Engine Credit	0.88	0
2	Engine	100% Reserve Credit	0	1
Total Engine Credit:			4.67	1
Maximum Credit Receivable (5,800 l/gpm):			7	1

Response areas with five buildings that are 3 storeys or 10 m (35 ft) or more in height, or districts that have a Basic Fire Flow greater than 3,300 IGPM, or any combination of these criteria, should have a Ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed Ladder companies for fire insurance grading to receive maximum credit. There are multiple buildings within the HRM Response Zone 7 that are three storeys or more in height. In addition several of the calculated Required Fire Flows were greater than 3,300 IGPM. Currently there is one Quint stationed at Station 7. Fire Station 7 received Primary Ladder Credit for the Quint at Station 7 and Support Ladder Credit for one Quint from Station 5. The credit received for Support Ladders was downgraded based on the distance from the responding hall. Station 7 received credit for 1.74 Ladders out of the maximum 2 Ladder companies that can be credited for grading.



Table 4 Credited in Service Ladder Summary

Station #	Vehicle Type	Apparatus Credit	Ladder Credit	Reserve Ladder Credit
7	Quint	100% Ladder Credit	1	0
5	Quint	74% Ladder Credit	0.74	1
Total Ladder/Reserve Ladder Credit:			1.74	1
Maximum Credit Receivable (5,800 Igpm):			2	1

Staffing at Station 7 was evaluated in its ability to meet the staffing requirements as determined by the Basic Fire Flow benchmark from the Table of Effective Response. The total available fire force grading item is weighted heavily within the fire insurance grading of the fire department. The staffing was measured against the FUS benchmark of at least six competent career fire fighters available and assigned to respond to fire for duty with each required Engine and Ladder Company. The number of first due (initial response) engine companies and ladder companies based on the benchmark Basic Fire Flow of 5,800 IGPM is two Engine companies and one Ladder company. The maximum credit that Station 7 can receive for initial available fire force response for two engine companies and one Ladder company is 18 fire fighters. NFPA 1710 requires each fire apparatus to be staffed with a minimum of four personnel. The current initial response from Station 7 is one Quint staffed with four fire fighters. The station was therefore credited with four fire fighters available for initial response out of the maximum 18 fire fighters that can be credited.

Station Location

Station 7 is well located for response. Figure 1 identifies the 2.5 km, 5 km and 8 km coverage areas for Station 7. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.



Fire calls

The historical calls for Station 7 cover a large area of the HRM. Figure 3 shows the response of Station 7 based on its historical calls for the years 2010 to 2013. Station 7 responded to an average of 581 calls in the in the 45 months reviewed. The following table is a breakdown of the calls from 2010 to September 2013. The total for 2013 reflects the emergency calls for the first 9 months of the year. Table 6 shows the breakdown of emergency calls by incident type. The year average was calculated for all calls over the 45 months.

Table 5 Total Emergency calls per year

Total Calls per Year 2010 - 2013	
Year	No. of Calls
2010	592
2011	641
2012	514
2013	433

Table 6 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	224	60	10.3
False alarm	844	225	38.7
Smoke	257	69	11.8
Motor Vehicle Accident	344	92	15.8
Oil or Gas spill	28	7.5	1.3
Other	93	25	4.3
Rescue	1	0.3	0.0
Medical Assist	143	38	6.5
Coding	246	66	11.3



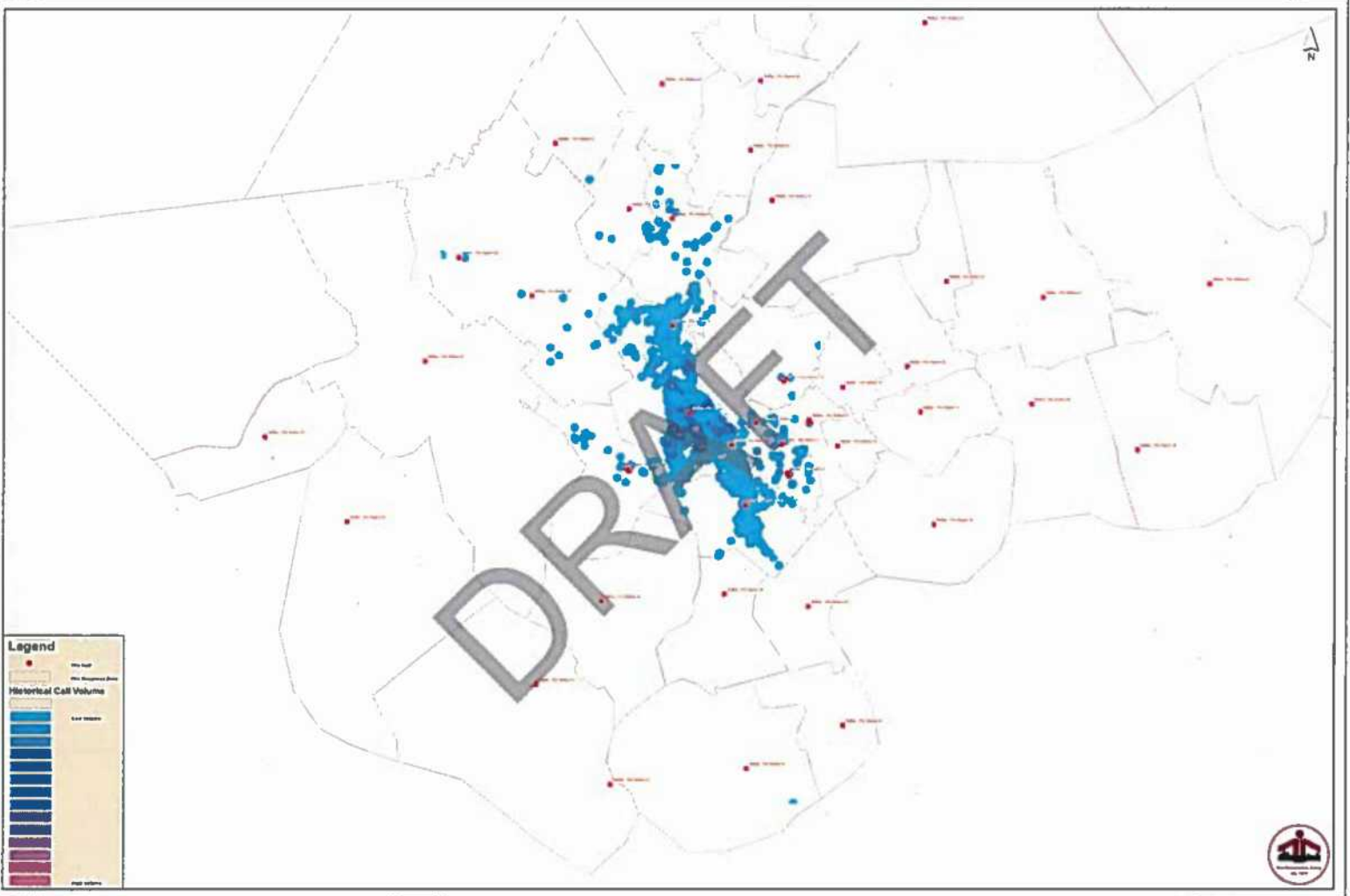
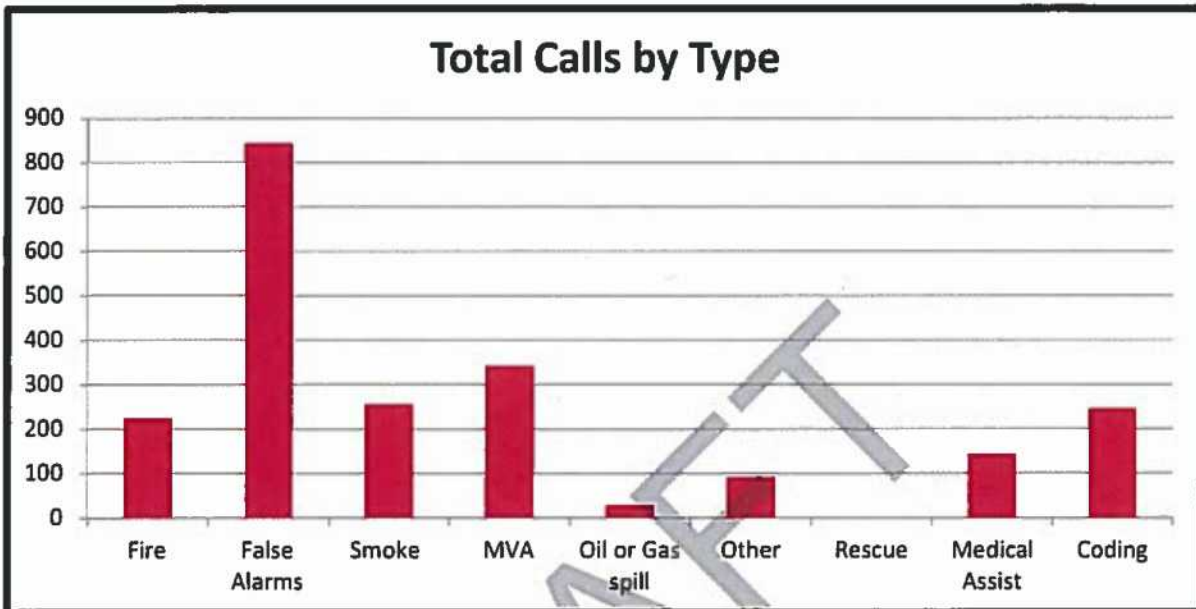


Figure 4 Emergency Calls by Incident Type (2010-2013)



The largest percentage of calls to Station 7 was False Alarm (detectors) fire calls. Currently there is a fine applied to false alarms but it was found to be minimal. The resulting cost of time, apparatus and personnel responding to a fire alarm should be considered when determining applicable fines. The fines should be increased so as to deter false alarms and encourage building owners to maintain and repair fire alarm systems rather than pay a fine for a false alarm. For motor vehicle accidents, the fire department should submit their invoice for services provided as a result of an accident involving a motor vehicle or for a loss to a motor vehicle (i.e. fire) to the Province.

In reviewing the emergency call data it was noted that improvements need to be made in the call reporting procedure. HRM should implement a standard around the time stamping of fire calls and review each month for conformance with the standard and conformance with the "Service Delivery Standards for Halifax Regional Fire and Emergency" for all portions of the call listed in the service delivery standard.



Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Within the HRM Relative Classifications for Emergency Communications, Fire Prevention and Safety Control were determined and applied as a single grade across the entire city.

Relative Classifications for Fire Department and Water Supplies were calculated specifically for individual areas as follows:

- Relative Classification for each Fire District i.e. the primary geographic response zone for each fire station (52 stations in 2013).
- Relative Classification for each Major Pressure Zone (SCADA zone) (3 distribution areas in 2013).

The Fire Department Assessment contributes 40 percent to the total Public Fire Protection Classification grade. This is the most heavily weighted portion of the grading and as such is considered to be the most significant indicator of a community or municipality's overall preparedness for dealing with fire emergencies.

[REDACTED] This forms the basis of the relative classification of the Fire Department.



Figure 5 Fire Department Item Weights

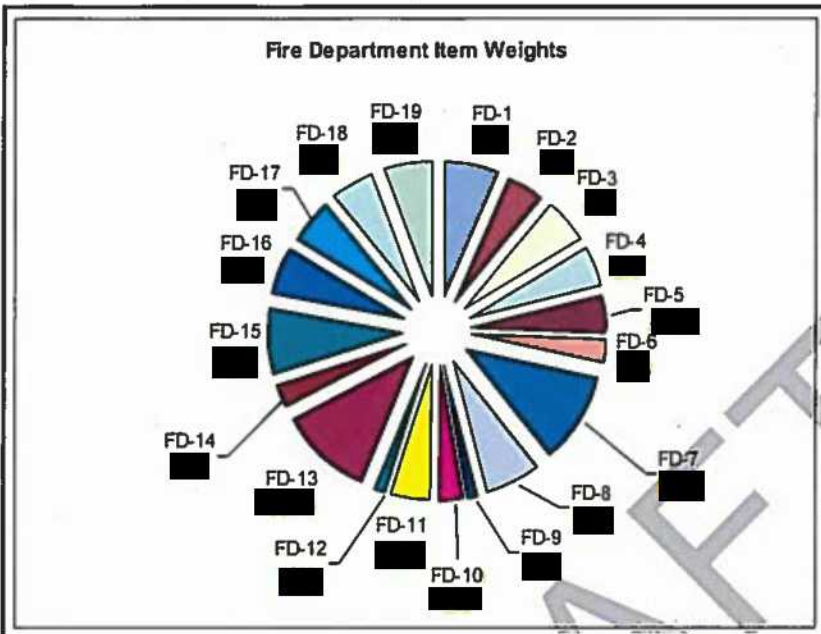


Figure 6 Fire Department Credit Points

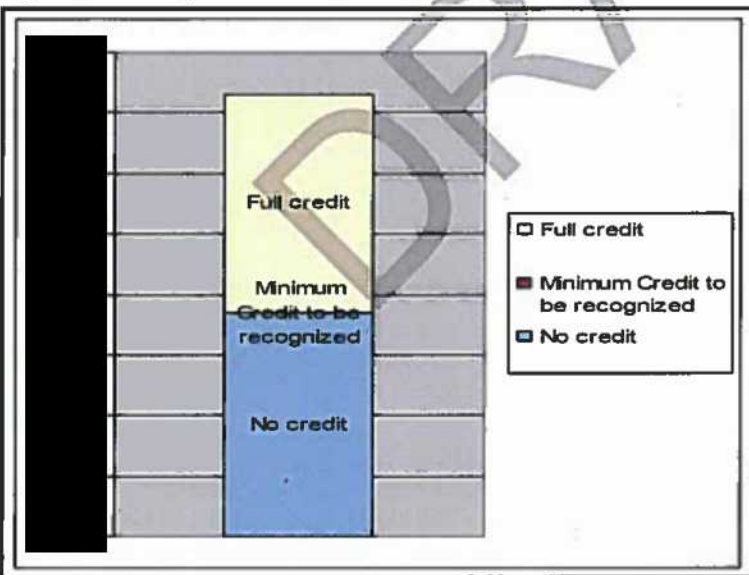


Table 7 Fire Department Grading Items Overall Summary

Grading Item	Category	Credit Received	Maximum Credit	% of FD	% of All
FD-1	Engine Service	215			
FD-2	Ladder Truck Service	160			
FD-3	Distribution of Companies and Type of Apparatus	195			
FD-4	Engine and Ladder Pump Capacity	170			
FD-5	Design, Maintenance and Condition of Apparatus	148			
FD-6	Number of Line Officers – Fire Suppression	71			
FD-7	Total Fire Force Available	184			
FD-8	Engine and Ladder Company Unit Manning	186			
FD-9	Master and Special Stream Devices	47			
FD-10	Equipment for Engines and Ladder Trucks, General	98			
FD-11	Fire Hose	166			
FD-12	Condition of Fire Hose	33			
FD-13	Training and Qualifications	369			
FD-14	Response to Alarms	74			
FD-15	Fire Ground Operations	234			
FD-16	Special Protection Required	194			
FD-17	Miscellaneous Factors and Conditions	185			
FD-18	Pre-Incident Planning	77			
FD-19	Administration	190			
Weight in Grading	40			Credit Received	25.44
Relative Classification					
4					



Figure 7 Fire Department Grading Items Overall Summary



Fire Station 7 was assigned a Relative Class of 4. The figure above shows each grading item of the fire department and how much credit was received and how much credit is still available within each grading item. The relative classification contributes to the overall Public Fire Protection Classification (PFPC) of Fire District 7 and that of the entire Halifax Regional Municipality. Factoring in the Water Supply, Fire Safety Control and Emergency Communication grading items, Fire Station 7 was assigned an overall Public Fire Protection Classification of 4. This indicates that the level of response is proportionate to the level of risk in the fire protection district.

Maintaining the Public Fire Protection Classification for Station 7 will ensure residents within the fire protection area receive the full benefit of available property insurance premium discounts based on the level of fire protection provided. In the event the Station 7 is downgraded to a PFPC 5 the resulting cost to the tax payer in the form of insurance costs would be approximately \$3,500,000.00 in insurance premium increases for the zone. These values are estimates only as insurance rates are dynamic and dependent on a large number of factors. A further point to consider is that as the PFPC decreases in value, i.e. going from PFPC 5 to PFPC 4 the capacity of an insurer to underwrite in the City can change



and in turn can create competition which may lower rates. It is difficult to quantify the true effects and figures given here are estimates.

Table 8 Premium Estimates under the Public Fire Protection Classification System

Public Fire Protection Classification	Total Premium Estimates Prior to FUS Study	Total Premium Estimates Post FUS Study	Total Premium Estimates Difference
3	\$5,510,915		
4		\$5,951,788	\$440,873
5		\$9,093,010	\$3,582,095

Recommendations

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



STATION 8
15 Convoy Run



Station 8 is located in the area of Bedford near the intersection of the Hammond Plains Road. The station exits onto Convoy Run at the corner of the Bedford Highway which has Traffic control on the stop lights for highway entrance. Station 8 also houses the Police and 911 redundancy centre. Figure 1 shows the 2.5km, 5km and 8km coverage from Station 8.

Building and Tarmac

The station is constructed of concrete block with brick veneer, roof construction is composed of truss and asphalt shingles. The tarmac is an asphalt covered area which extends from the bay door to the street and covers a small public parking area extending across the bay door area. The paved area extends around the building to the rear bay doors. The tarmac is sufficient to pull all of the apparatus out of the hall completely for daily inspections and run up routines.



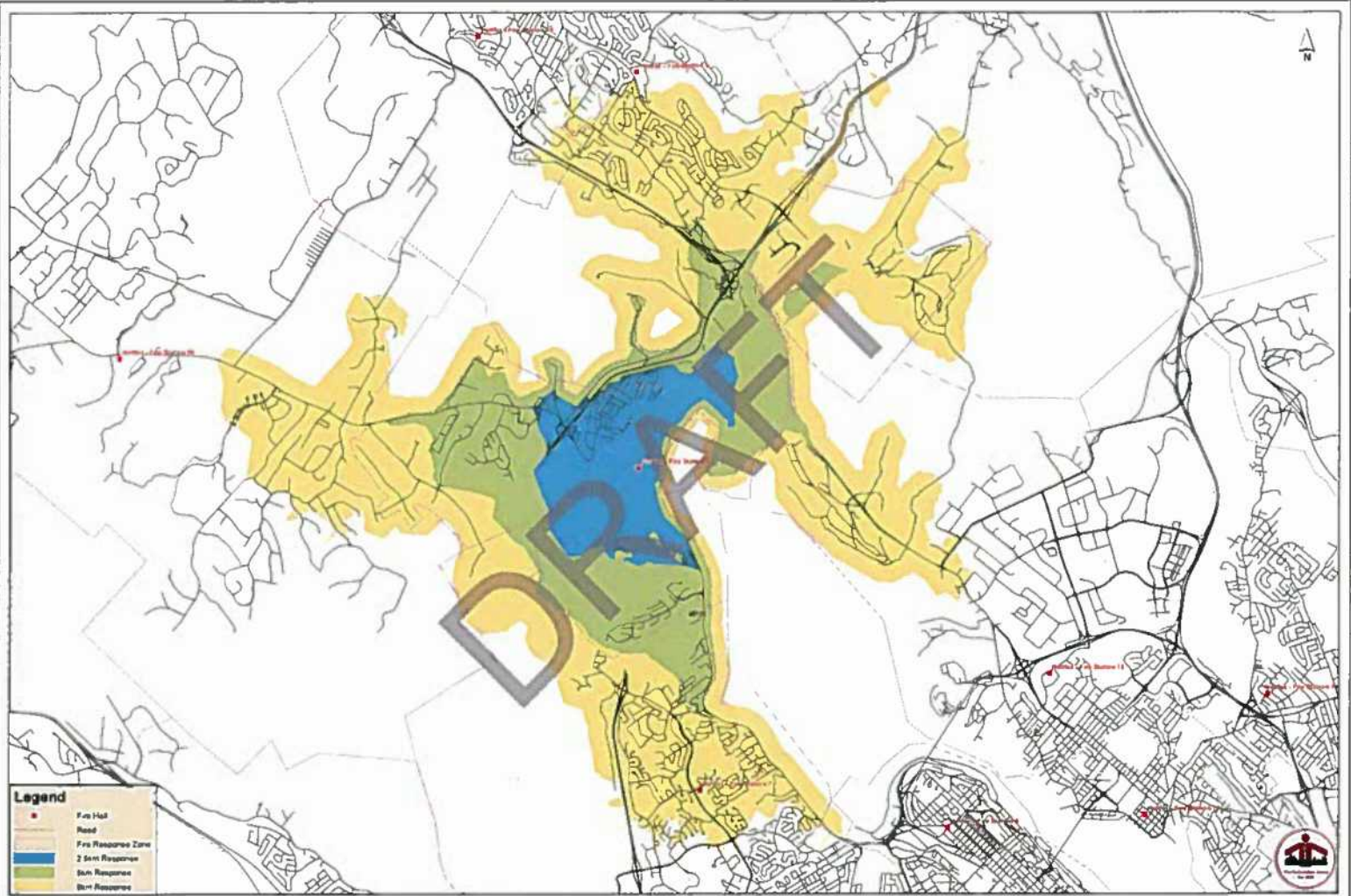


Figure 1 - 2 Sert/5min Response from Fire Station 8

Scale = 1:10,000

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The station has sleeping quarters that presently house five staff. These consist of Officer's quarters and an office with washroom and shower across the hall from the quarters. On the main level (Convoy Run Level Road level) is the remainder of the quarters for staff, kitchen, dining area, an additional washroom, exercise room, locker room, two communication areas, and a day room. The volunteers have a separate area in the station.

Station 8's accommodation for officers is a combination of sleeping quarters and an office. The rooms are private and the officer has computer access to carry out daily record management. Crew quarters are separate rooms containing two bunks. A day room is set up for recreation as well as for use as a training area. It is well equipped with chairs, a television and desk area for working.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

Community Risk Profile

A fire hazard and risk assessment was conducted throughout the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 6,558 Required Fire Flows were calculated for Response Zone 8 as shown in Figure 2 below. Table 1 below depicts the average Required Fire Flows calculated.



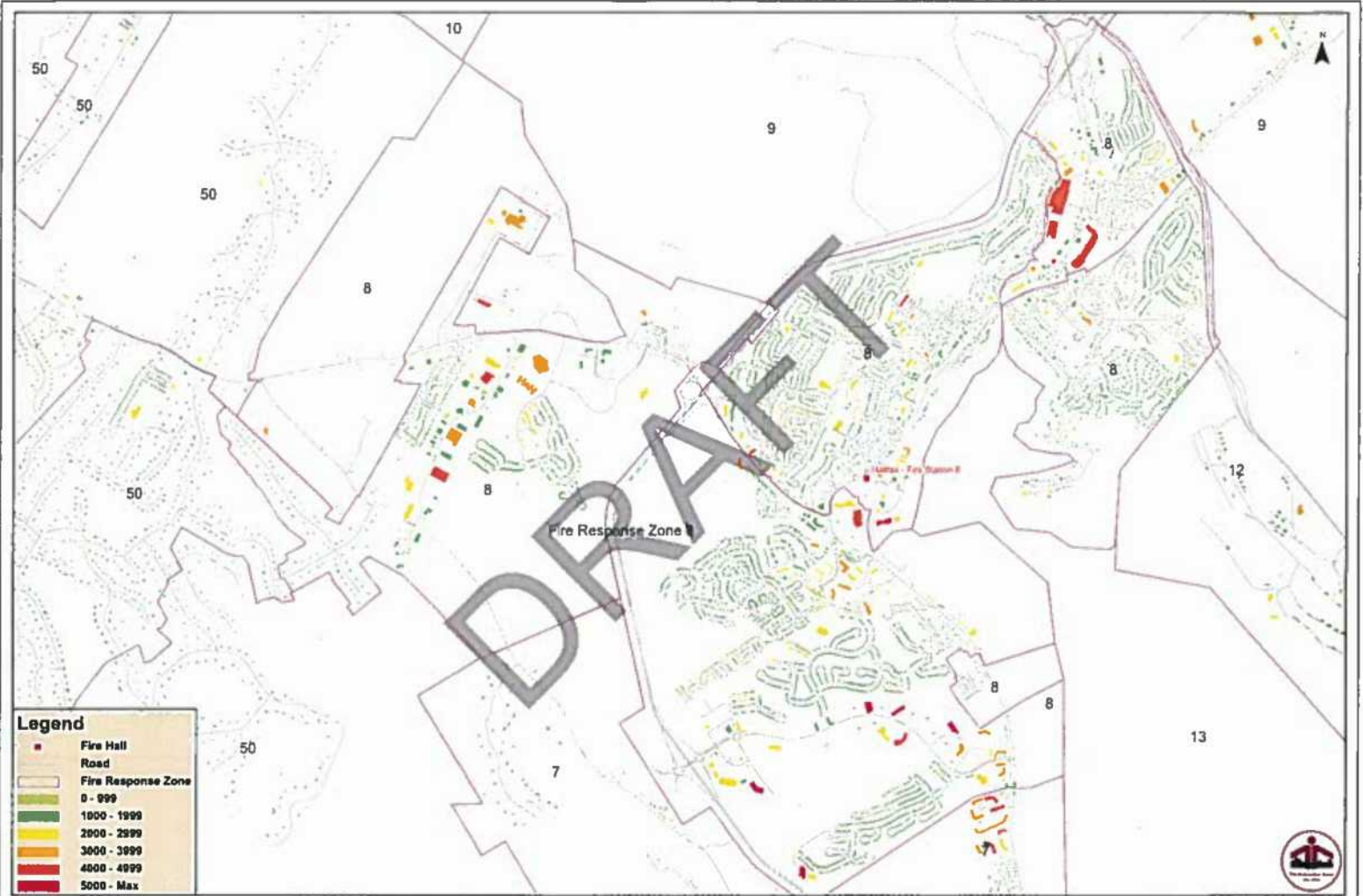


Figure 2 Halifax Fire Response Zone 8 - Building Footprints with RFF Value

Table 1 Required Fire Flow Distribution

RFF Range	No. of RFF points
0-999 IGPM	1643
1000-1999 IGPM	4724
2000-2999 IGPM	133
3000-3999 IGPM	32
4000-4999 IGPM	13
>=5000 IGPM	13

In addition the Basic Fire Flow was determined for the response area. The Basic Fire Flow is usually calculated as the 95th percentile RFF value or the 5th highest in the Fire Response Area. Considerations are given to the exposure risk, quantity of risks, and type of distribution. The 95 percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response Zone 8 is based on the fifth highest which is 5,900 Imperial Gallons per Minute.

Table 2 Response Zone 8 Basic Fire Flow

Total RFF Points	6,558	
	IGPM	L/s
90th Percentile	1,400	106.12
95th Percentile	1,700	128.86
Max	6,600	500.28
5th highest	5,900	447.22



Apparatus & Personnel

Standard staffing for Station 8 is a 3 person 24/7 shift with a complement of 40 Volunteers as support staffing. The compliment of volunteer staff is a group of well-trained individuals having NPFA Level 1, Level 2 training and a number of other training courses. Of the 40 volunteers only a small number participate regularly in actual fire emergencies. Although all maintain proficiency through training and practice, majority do not respond to actual calls. [REDACTED]

[REDACTED] By reducing the number of volunteers by approximately 50% located in each station and by selecting volunteers who would be most active, the city would maintain the protection provided by having the volunteer service and reduce costs.

Apparatus at Station 8 consists of a tactical support and 2 structural engines. Based on the Basic Fire Flow of 5,900 Imperial Gallons per minute, the apparatus requirements defined in the Fire Underwriters Survey - Table of Effective Response is as follows:

- First due Pumper Company in 2.5 minutes.
- Second due Pumper Company in 4 minutes.
- First due Ladder Company in 3.5 minutes.

The benchmark number of Engine Companies required for a Basic Fire Flow of 5,900 IGPM is seven Engine companies in 7.5 minutes and two Ladder companies in 5 minutes. Values are cross referenced with the Table of Effective Response. These benchmark requirements are based on a Public Fire Protection Classification 1.

Fire departments are evaluated based on the response distances for engine and ladder companies from the fire station to a risk. Fire apparatus should be located such that response distances are not excessive. Although a ladder and additional compliments are available from surrounding stations, response times are excessive. As shown in Table 3 below, the credit received for fire insurance grading is 4.28 Engines out of a maximum 7 Engine companies that can be credited and 0.68 Ladder companies out of a maximum 2 Ladder companies. To improve the firefighting capabilities and increase the credit received for fire insurance grading purposes, a minimum of additional quint and crew is required at Station 8.



Table 3 Credited in Service Engine and Ladder Summary

Station	Vehicle Type	Apparatus Credit	Engine Credit	Ladder Credit
8	Engine	100% Engine Credit	1	0
8	Engine	100% Engine Credit	1	0
7	Quint	48% Engine Credit	0.48	0
9	Engine	73% Engine Credit	0.73	0
9	Engine	73% Engine Credit	0.73	0
5	Quint	34% Engine Credit	0.34	0.68
Total Engine/Reserve Engine Credit Received:			4.28	0.68
Maximum Credit Receivable (BFF 5,900 Igpm):			7	2

Station Location

Station 8 is not well located for response. Much of its coverage area extends into the Bedford basin. Figure 1 identifies the 2.5km, 5km and 8km coverage areas for Station 8. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

An optimization analysis was carried out to determine the optimum location for Station 8. To carry out the analysis, all the Required Fire Flow points located in the fire hall response area were selected. The locations of surrounding fire halls were maintained. The location of fire hall 8 was then optimized under two conditions:

- Maximum coverage of properties based on their respective first due response distances
- Maximum coverage of properties based on the 5km response distance

The coverage statistics were analyzed and the results are shown in Figure 3 below. When the coverage for first due was optimized, the coverage was increased by 218 properties (2.36%) from the current location but the coverage at 5km is reduced by 333 properties (-3.61%). When the coverage for 5km was optimized, the coverage was increased by 34 properties (0.37%) from the current location but the



coverage for first due drops by 556 properties (-6.03%). The analysis was also carried out considering future road network and the results were found to be the same.

The results of the analysis are shown in Figure 4, 5 and 6 below.

Figure 3 Optimization Analysis for Station 8 – Coverage statistics

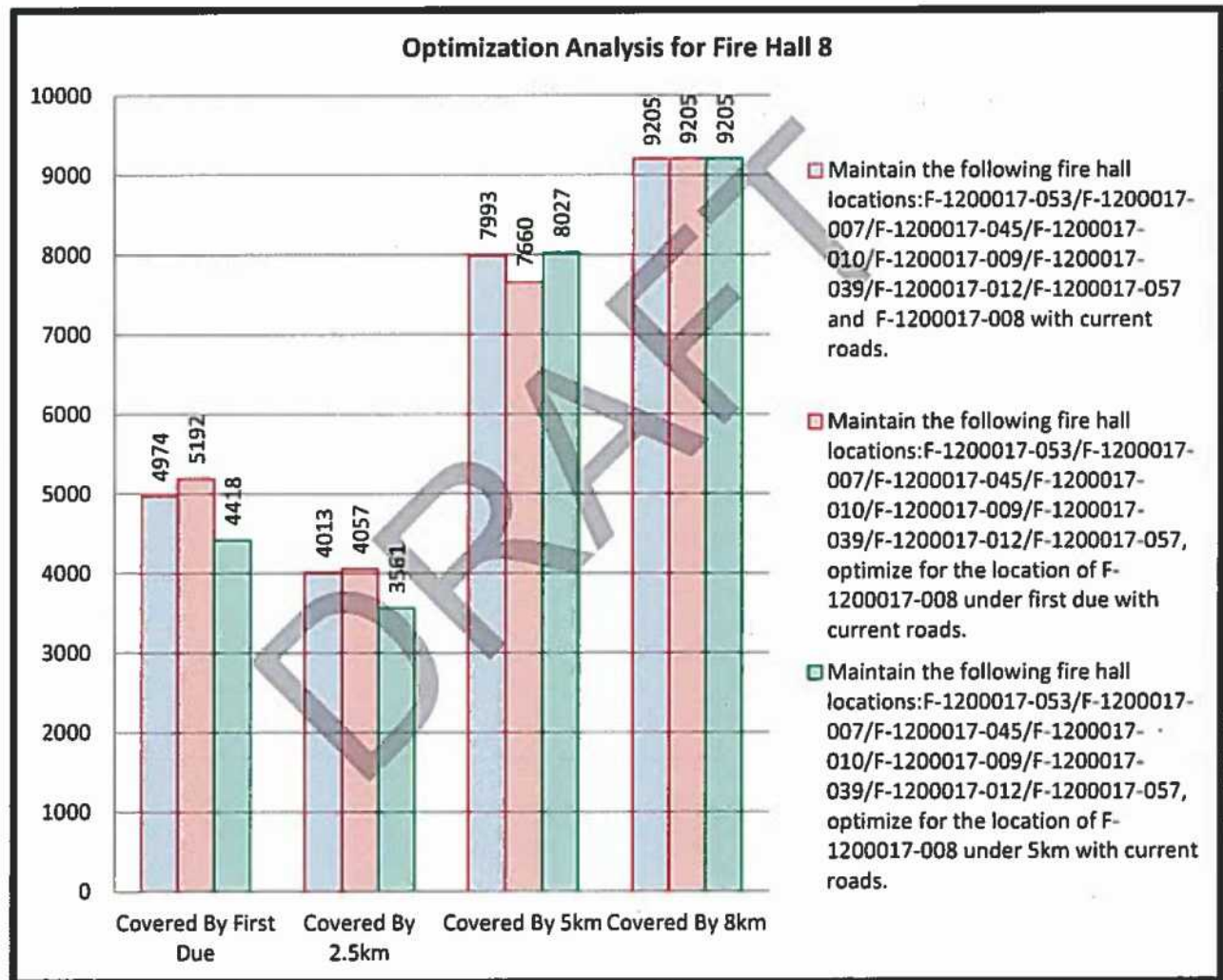
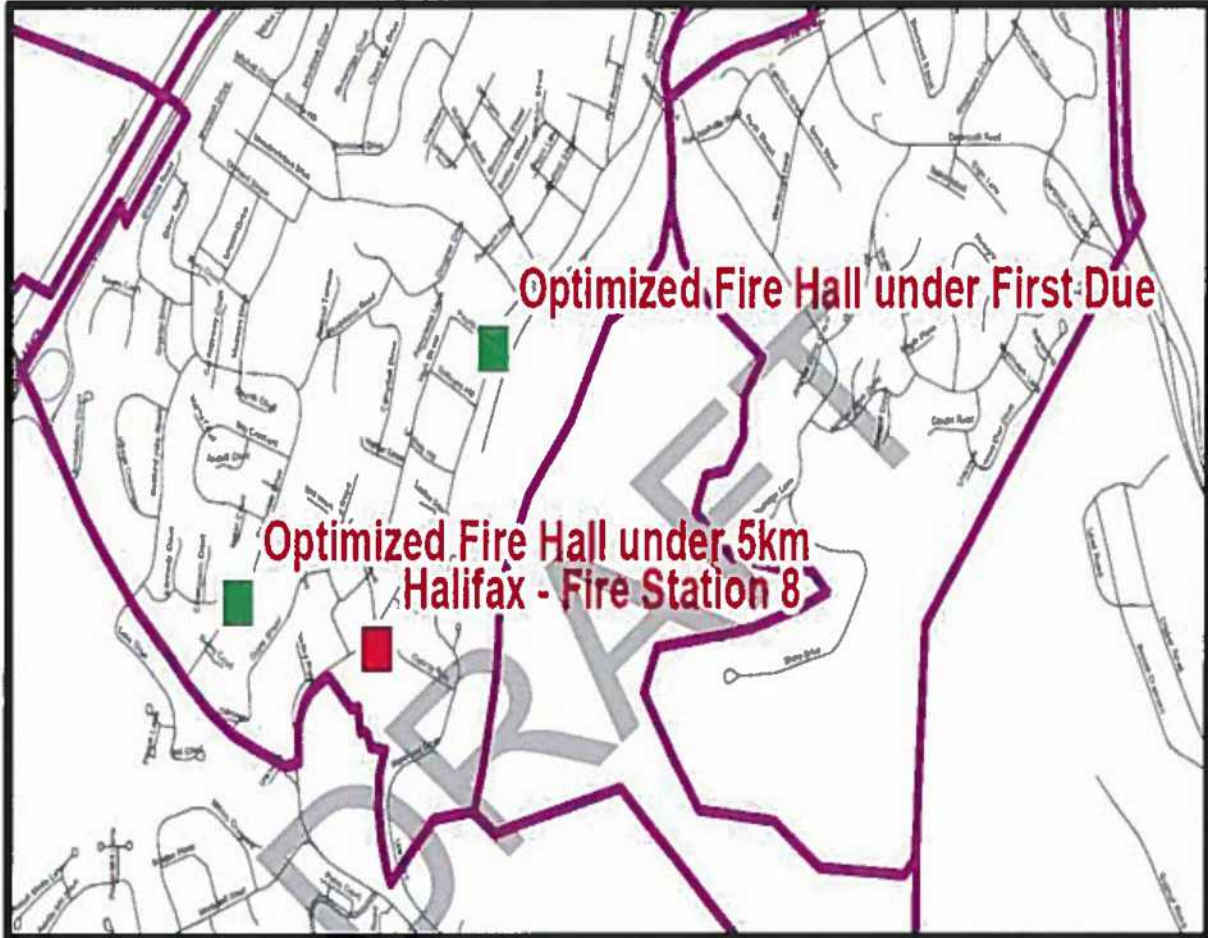
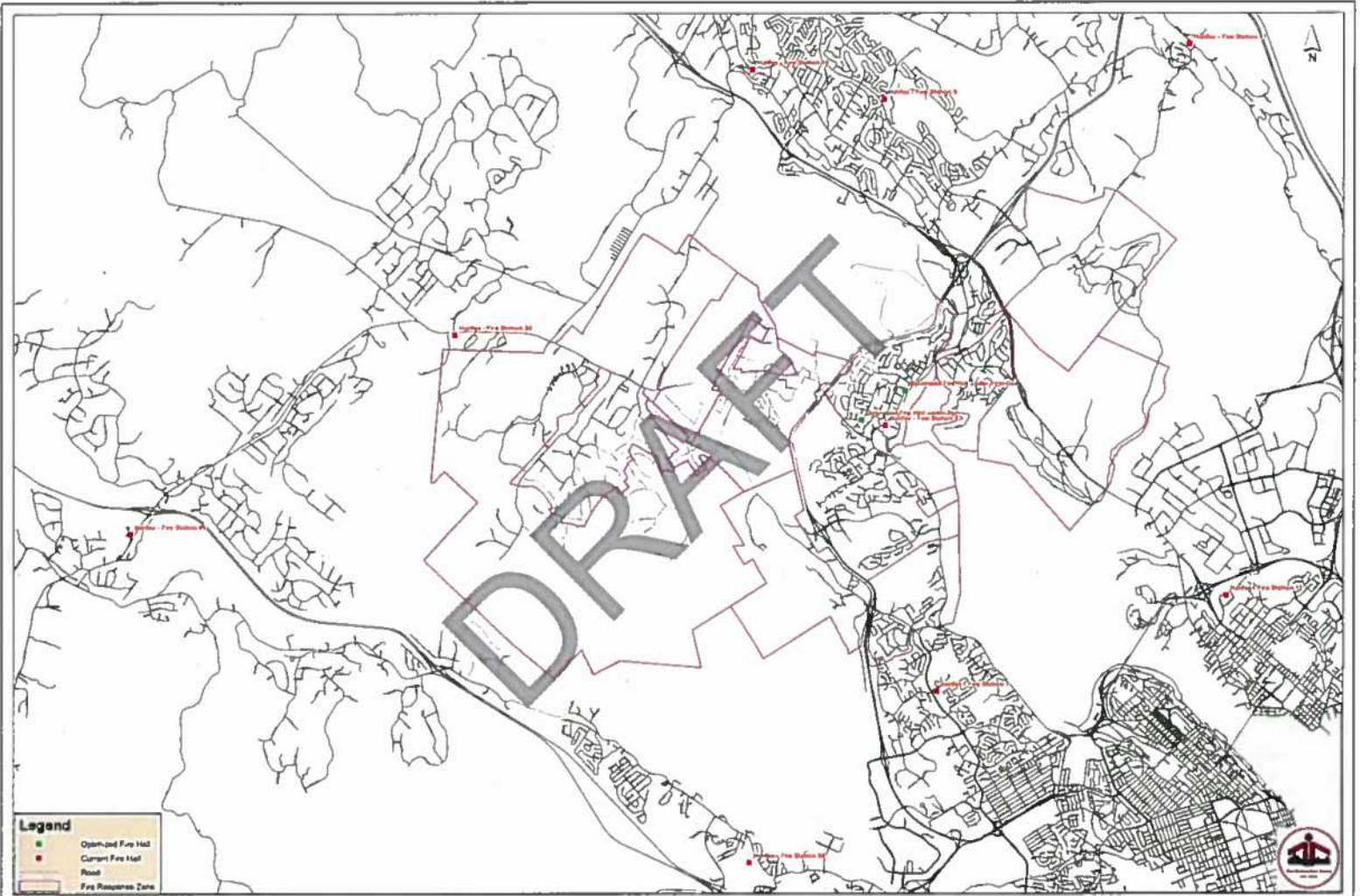


Figure 4 Optimization Locations for Station 8 – First due and 5km response





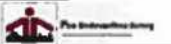
Legend

- Optimized Fire Hall
- Current Fire Hall
- Road
- ▭ Fire Response Zone

Regional Municipality of Halifax

Optimized Location of Fire Station 8 with Current Roads (2014-07-29)

Scale = 1:23,000



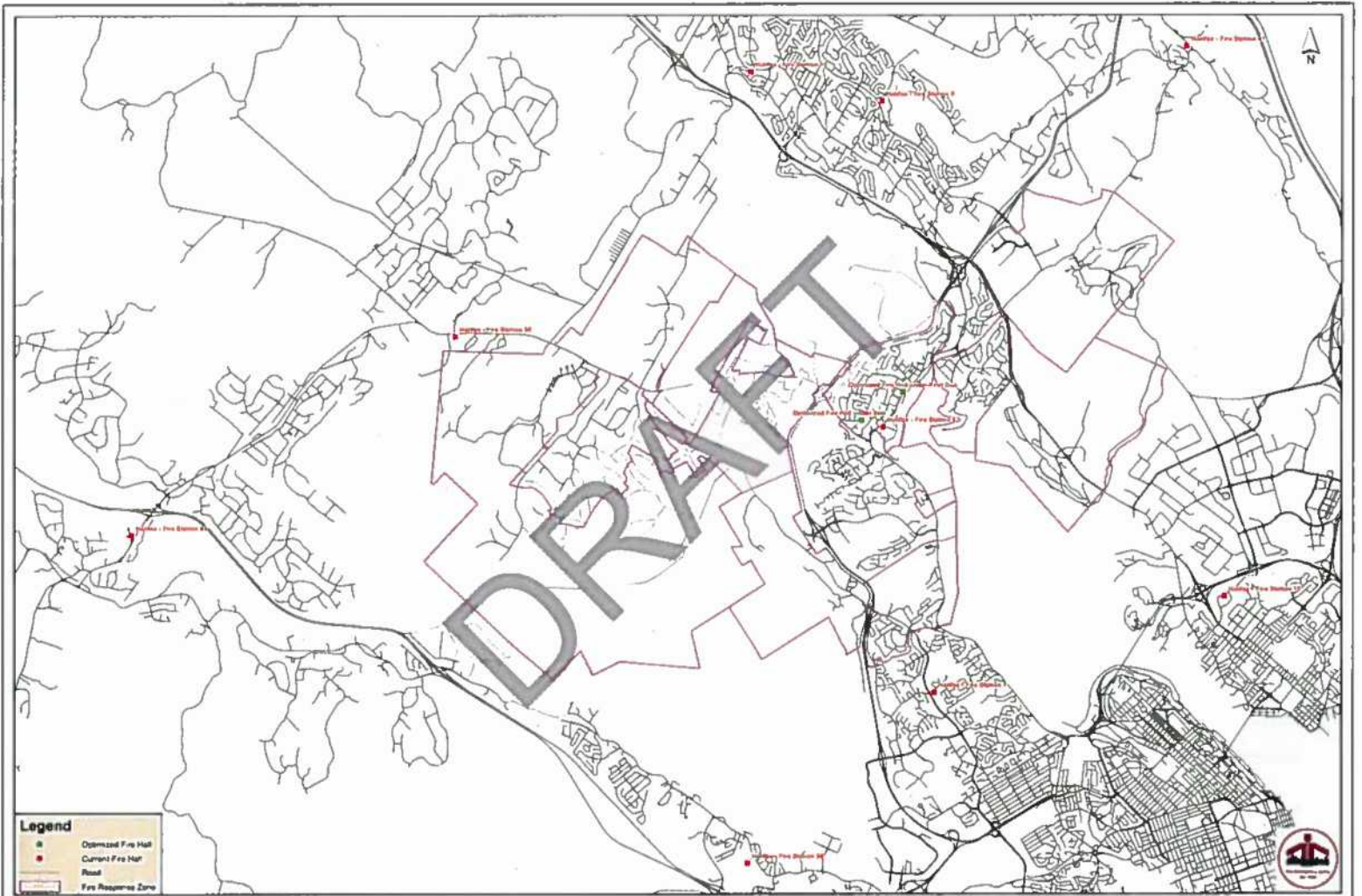


Figure 8 Optimized Location of Fire Station 8 with Future Roads (2014-07-25)

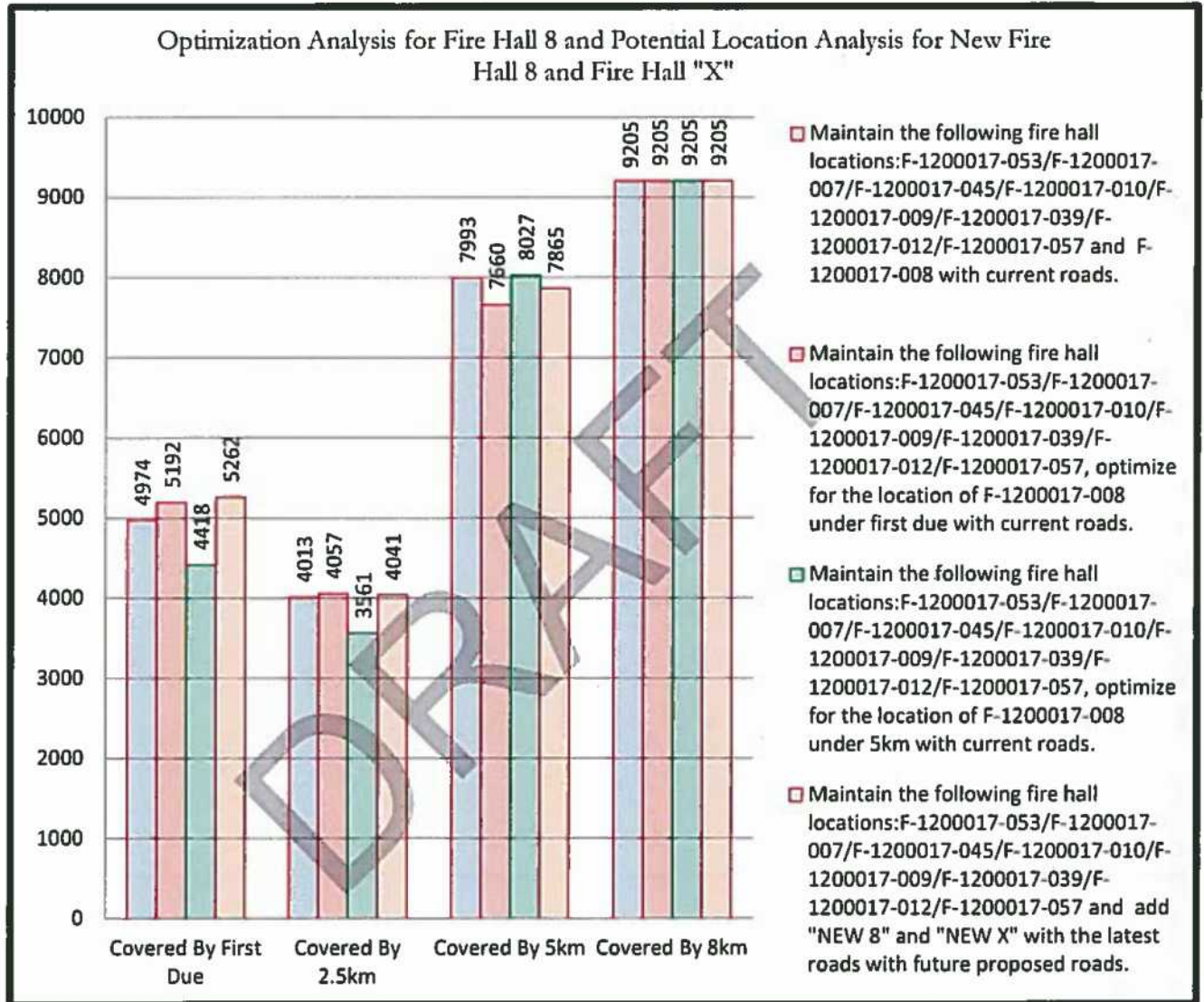
The conclusions drawn from the optimization of Station 8 is that there is little benefit to only relocating Station 8. The next series of analyses dealt with extending Station 8's coverage to include upcoming developments on Larry Uteck drive and beyond by relocating Station 8 and adding a new fire hall in the Larry Uteck area. The new location selected for Station 8 is at the intersection of Highway 102 and 101. The new fire station X would be constructed on Larry Uteck drive to provide coverage to the new subdivision and the Hammonds Plains Road area. The surrounding stations would remain in their current locations. A coverage analysis for this scenario was carried out and the results are shown in Figure 7 below. The results show that with this arrangement, coverage under First Due response and 2.5 km coverage will increase slightly. Figure 8 shows the 2.5 km, 5 km and 8 km coverage for this fire hall arrangement. This option, while improving the overall coverage for the area, results in higher costs as the need for an Aerial apparatus and addition crew at Station 8, as well as a crew of at least four fire fighters at the new station, will have to be addressed.

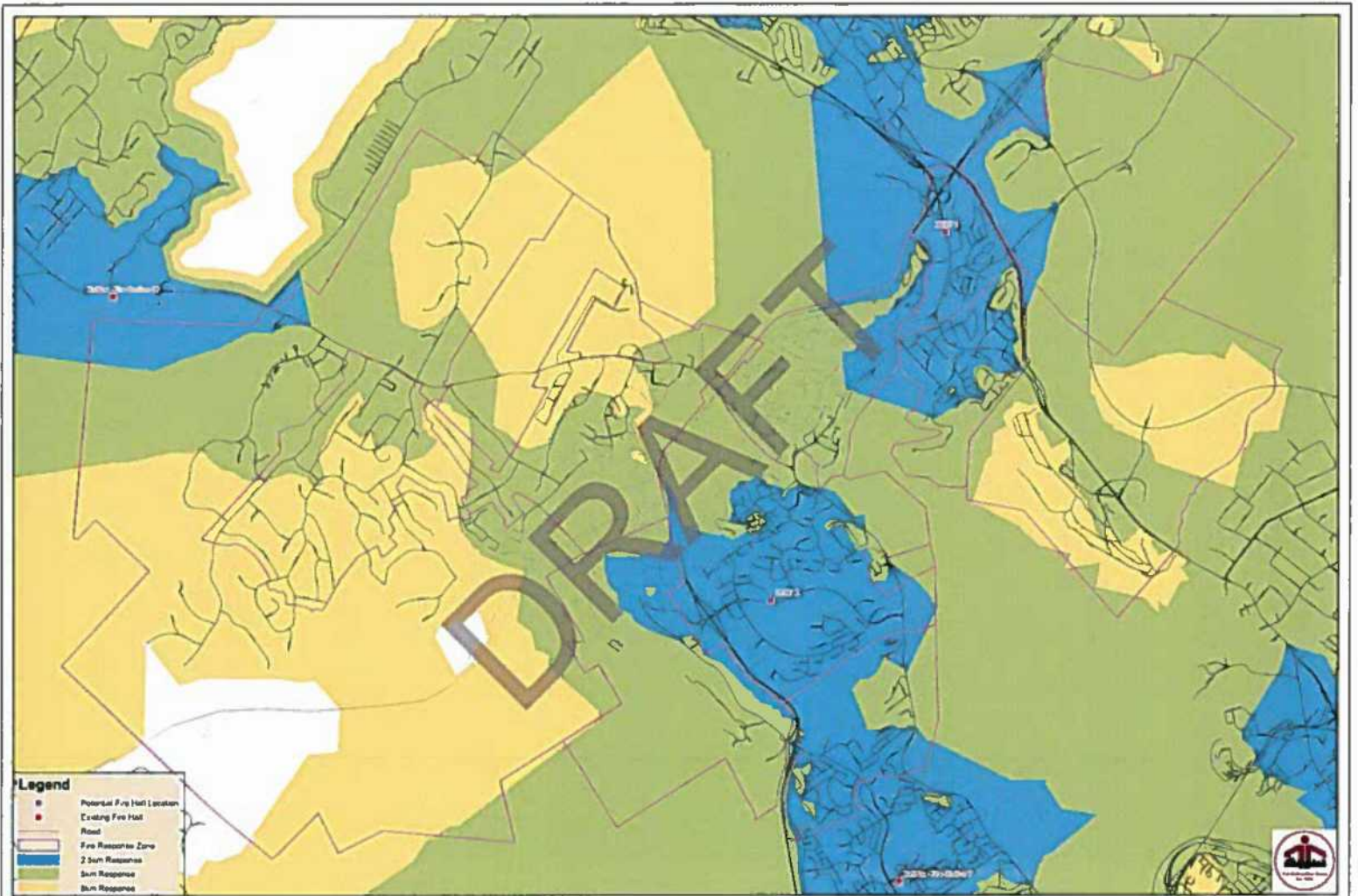
The final analysis considers the same locations as identified in Figure 7; however instead of relocating Station 8 to the proposed location (intersection of Highway 101 and 102), Station 9 was relocated with its apparatus and staffing from Metropolitan Drive to this location. Station 8 would then be relocated to the proposed location for fire hall "X". This option addresses the requirement for an Aerial device by replacing the Engine at Station 9 with a Quint at the new location. The Engine at Station 8 would be replaced with a Quint along with a four person crew. This would address the requirement for Ladders in both areas while eliminating the need for an increase in the overall staffing. The remainder of crews and apparatus would be transferred with their stations. Figure 9 shows the coverage for 2.5 km, 5 km and 8 km for this fire hall arrangement.

In the event station locations are not changed, an additional 24/7, four person crew located in the area around Larry Uteck Drive will be required to address the response requirements for the new subdivision currently under development.



Figure 7 Coverage Analysis for New Fire Hall 8 and New Fire Hall "X"

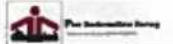


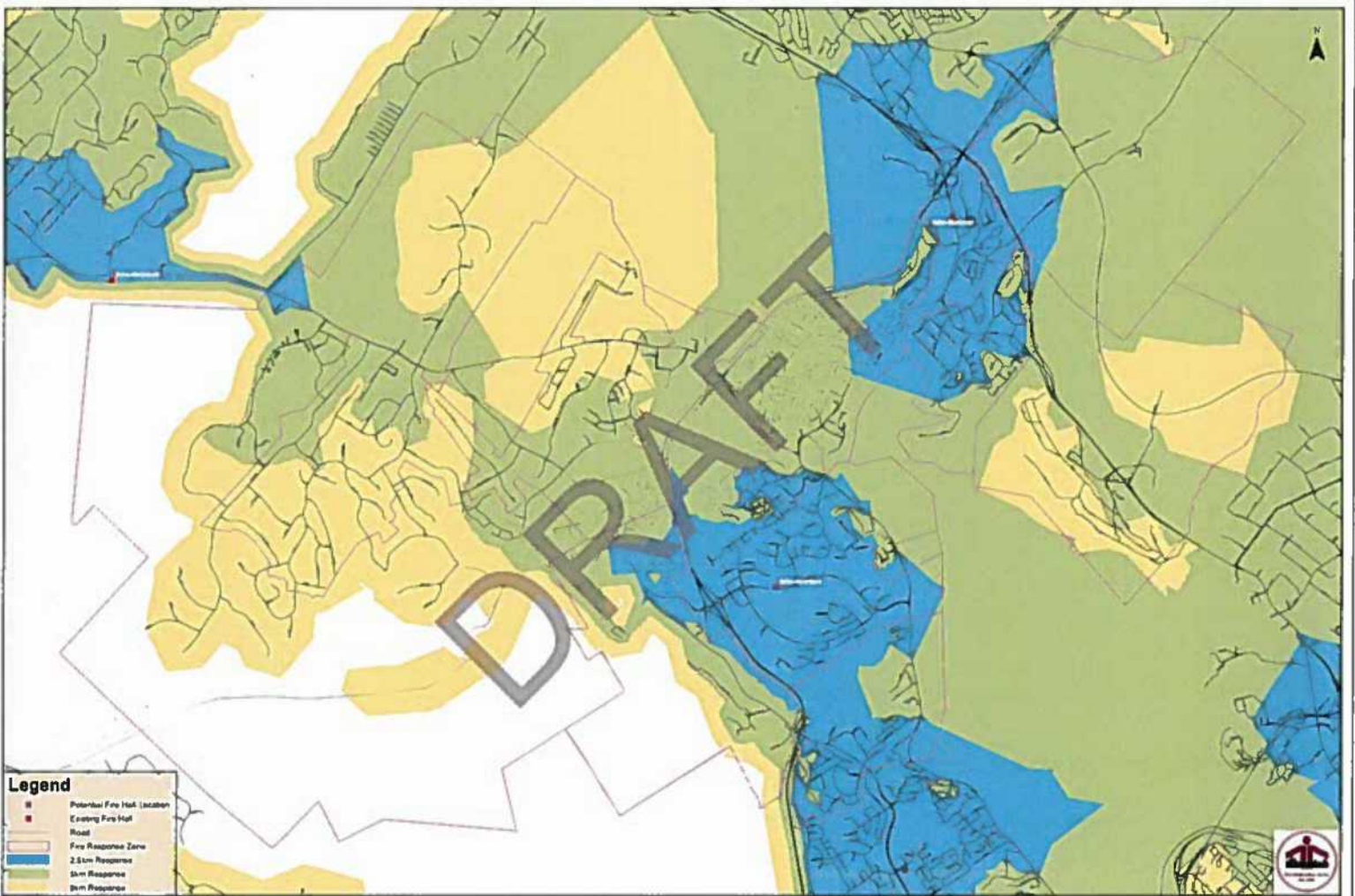


2.5/3km Responses from Two Potential Fire Hall Location and Surrounding Fire Halls (2014-10-16)

Regional Municipality of Halifax

Scale = 1:14,000





Fire calls

The historical calls for Station 8 cover a large area of the HRM. Figure 10 shows the response of Station 8 based on its historical calls for the years 2010 to 2013. Station 8 responded to an average of 903 calls per year in the 45 months reviewed. The following table is a breakdown of the calls from 2010 to September 2013. The total for 2013 reflects the emergency calls for the first 9 months of the year. Table 6 shows the breakdown of emergency calls by incident type. The year average was calculated for all calls over the 45 months.

Table 4 Total Emergency calls per year

Total Calls per Year 2010 - 2013	
Year	No. of Calls
2010	934
2011	836
2012	952
2013	667

Table 5 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	241	64	7.11
False alarm	1906	508	56.24
Smoke	447	119	13.19
Motor Vehicle Accident	241	64	7.11
Oil or Gas spill	111	30	3.28
Other	99	26	2.92
Rescue	3	1	0.09
Medical Assist	144	38	4.25
Coding	197	53	5.81



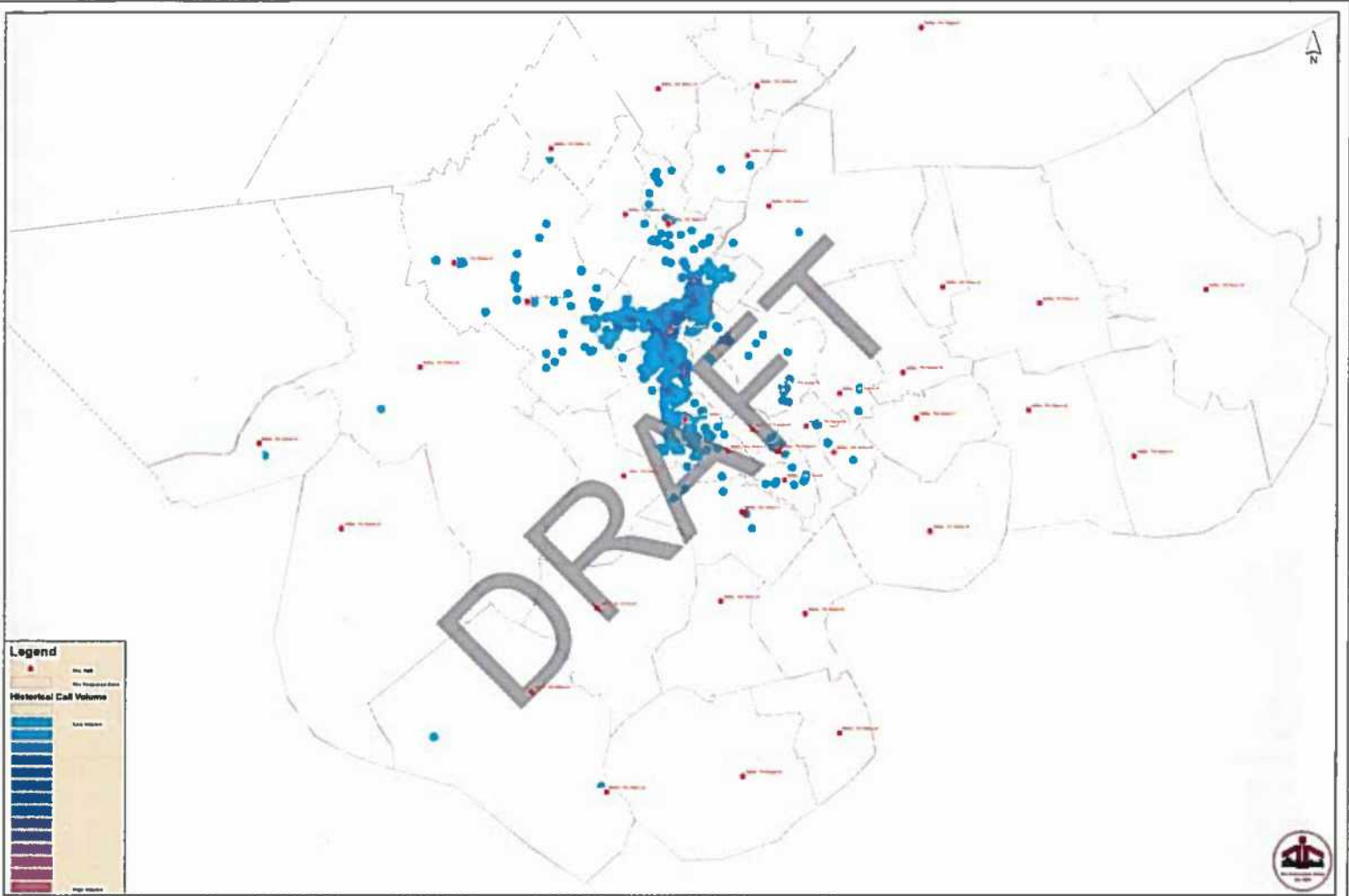
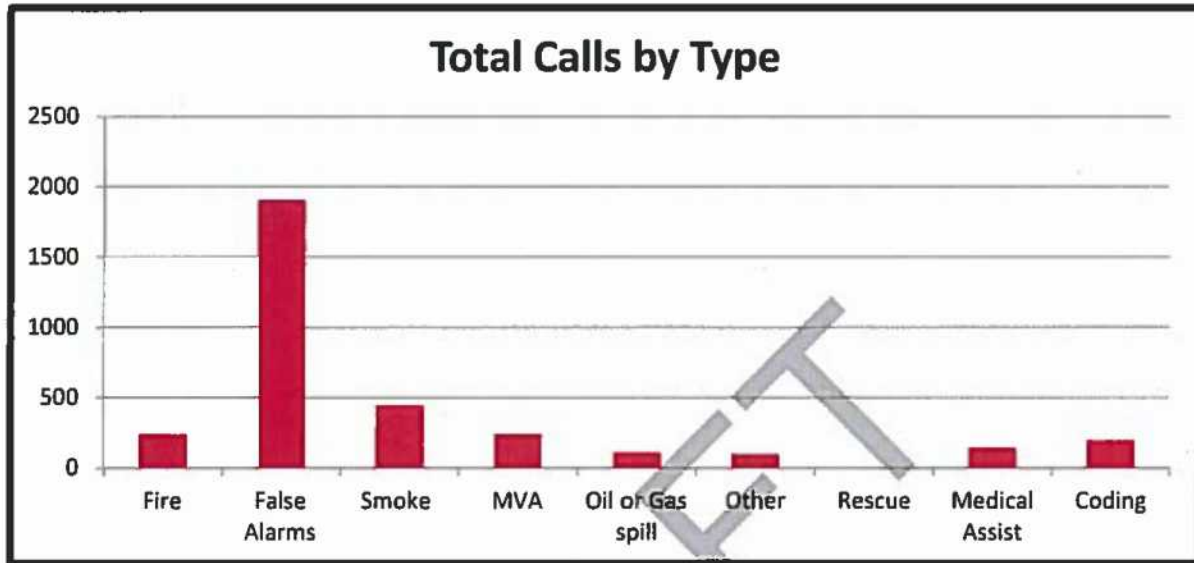


Figure 10 Historical Call Map - Fire Station 8

Scale = 1:70,000

Figure 11 Emergency Calls by Incident Type



The largest percentage of calls to Station 8 was False Alarm (detectors) fire calls. Currently there is a fine applied to false alarms but it was found to be minimal. The resulting cost of time, apparatus and personnel responding to a fire alarm should be considered when determining applicable fines. The fines should be increased so as to deter false alarms and encourage building owners to maintain and repair fire alarm systems rather than pay a fine for a false alarm. Motor Vehicle Accidents have a fund in Nova Scotia created by the provincial government. For such calls, the fire department should submit their invoice for services provided as a result of an accident involving a motor vehicle or for a loss to a motor vehicle (i.e. fire) to the Province.

A total of 1448 emergency calls occurred during the day time hours i.e. between 7am and 5pm. This represents 50% of the total emergency calls over the three years.

Table 6 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	626	18.5%
Daytime	0700 – 1659	1686	49.7%
Evening	1700 – 2359	1077	31.8%



In reviewing the emergency call data it was noted that improvements need to be made in the call reporting procedure. HRM should implement a standard around the time stamping of fire calls and review each month for conformance with the standard and conformance with the "Service Delivery Standards for Halifax Regional Fire and Emergency" for all portions of the call listed in the service delivery standard.

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Within the HRM Relative Classifications for Emergency Communications, Fire Prevention and Safety Control were determined and applied as a single grade across the entire city.

Relative Classifications for Fire Department and Water Supplies were calculated specifically for individual areas as follows:

- Relative Classification for each Fire District i.e. the primary geographic response zone for each fire station (52 stations in 2013).
- Relative Classification for each Major Pressure Zone (SCADA zone) (3 distribution areas in 2013).

The Fire Department Assessment contributes 40 percent to the total Public Fire Protection Classification grade. This is the most heavily weighted portion of the grading and as such is considered to be the most significant indicator of a community or municipality's overall preparedness for dealing with fire emergencies.

[REDACTED]

This forms the basis of the relative classification of the Fire Department.



Figure 12 Fire Department Item Weights

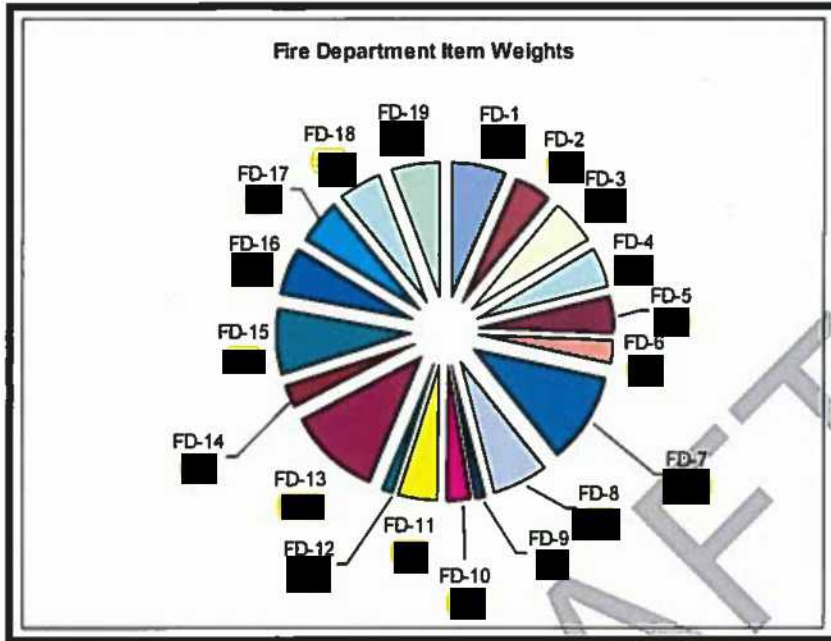


Figure 13 Fire Department Credit Points

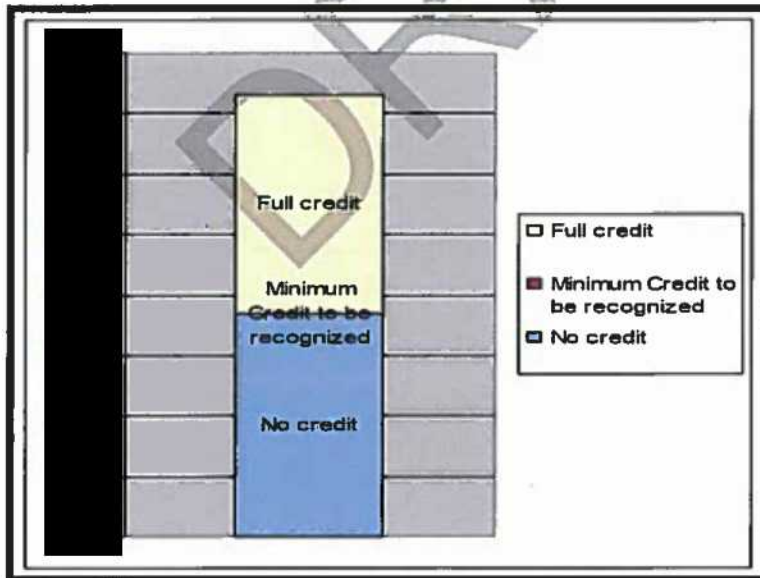
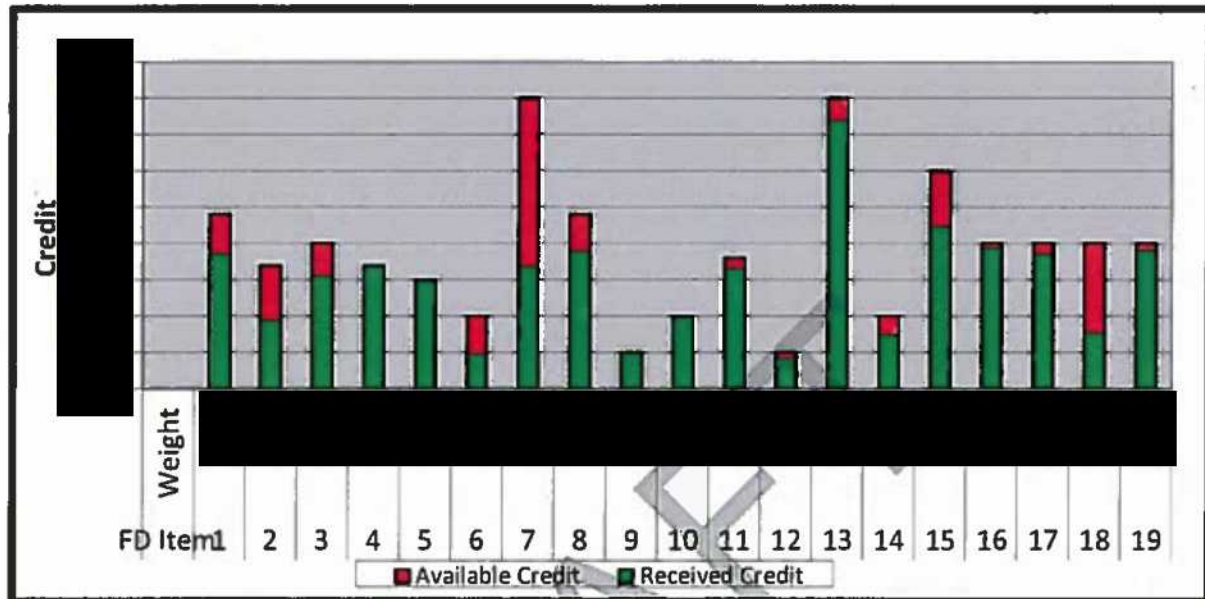


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FD-5	Design, Maintenance and Condition of Apparatus	148			
FD-6	Number of Line Officers – Fire Suppression	48			
FD-7	Total Fire Force Available	168			
FD-8	Engine and Ladder Company Unit Manning	189			
FD-9	Master and Special Stream Devices	50			
FD-10	Equipment for Engines and Ladder Trucks, General	98			
FD-11	Fire Hose	165			
FD-12	Condition of Fire Hose	41			
FD-13	Training and Qualifications	369			
FD-14	Response to Alarms	74			
FD-15	Fire Ground Operations	224			
FD-16	Special Protection Required	194			
FD-17	Miscellaneous Factors and Conditions	185			
FD-18	Pre-Incident Planning	77			
FD-19	Administration	190			
[REDACTED]					
[REDACTED]					
[REDACTED]					
Weight in Grading	40			Credit Received	21.61
Relative Classification					
5					



Figure 14 Fire Department Grading Items Overall Summary



Fire Station 8 was assigned a Relative Class of 5. The figure above shows each grading item of the fire department and how much credit was received and how much credit is still available within each grading item. The relative classification contributes to the overall Public Fire Protection Classification (PFPC) of Fire District 8 and that of the entire Halifax Regional Municipality. Factoring in the water supply, fire safety control and emergency grading items, Fire Station 8 was assigned an overall Public Fire Protection Classification of 5. Additional credit can be received by increasing the Ladder apparatus responding from the station 8 (FD Item 2) and improving the total available fire force at the hall (FD Item 6 and 7).

Maintaining the Public Fire Protection Classification for Station 8 will ensure residents within the fire protection area receive the full benefit of available property insurance premium discounts based on the level of fire protection provided. In the event that Station 8 is downgraded the resulting estimated cost to the tax payer in the form of insurance costs ranges between \$350,000.00 and \$3,000,000.00 in insurance rate increases for the zone. These values are estimates only as insurance rates are dynamic and dependent on a large number of factors. A further point to consider is that as the PFPC decreases in value, i.e. going from PFPC 5 to PFPC 4 the capacity of an insurer to underwrite in the City can change



and in turn can create competition which can lower rates. It is difficult to quantify the true effects and figures given here are estimates.

Table 8 Premium Estimates under the Public Fire Protection Classification System

Public Fire Protection Classification	Total Premium Estimates Prior to FUS Study	Total Premium Estimates Post FUS Study	Total Premium Estimates Difference
3	\$4,464,114		
4		\$4,821,243	\$357,129
5		\$7,365,788	\$2,901,674

Recommendations

- The optimization and coverage analysis carried out resulted in the following three options:

Option 1 - Place an aerial apparatus in Station 8. Assign a minimum four person crew in addition to the four career fire fighters currently stationed at the hall.

Option 2 - Relocate Station 8 to the proposed location at the intersection of Highway 101 and 102. Place a Quint and four person crew at Station 8. Construct a new station on Larry Utech drive and assign a 24/7 crew of four fire fighters at this station.

Option 3 – Relocate Station 9 to the intersection of Highway 101 and 102 and Station 8 to the site on Larry Utech Drive. Replace one Engine in each station with a Quint and maintain four person crews at each station.

- Considering the overall costs and coverage of each alternative, it is recommended that Option 3 be implemented.

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



STATION 9
1 Metropolitan Boulevard



Station 9 is located at 1 Metropolitan Boulevard in Sackville and is bordered by Metropolitan Avenue to the north. The station is located in a fairly central position for response to its overall coverage area. Figure 1 shows the 2.5 km, 5 km and 8 km coverage from Station 9.

Building and Tarmac

All fire stations should be of substantial construction, suitable for the service, and located and arranged for ease and quickness of response. Fire Station 9 is constructed of concrete block and steel and the roof consists of a built up roof system. The tarmac is an asphalt covered area which extends from the bay door to the street. The tarmac area is sufficient for vehicle run ups and day routines.





Figure 1 2 5/5km Response from Fire Station 9

Scale = 1:10,000

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. A kitchen area, sleeping quarters, a day room and a captain's office are located on the main floor of the building. Apparatus bays are located adjacent to the main building. The facilities at this station are adequate to meet the needs of the staff.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

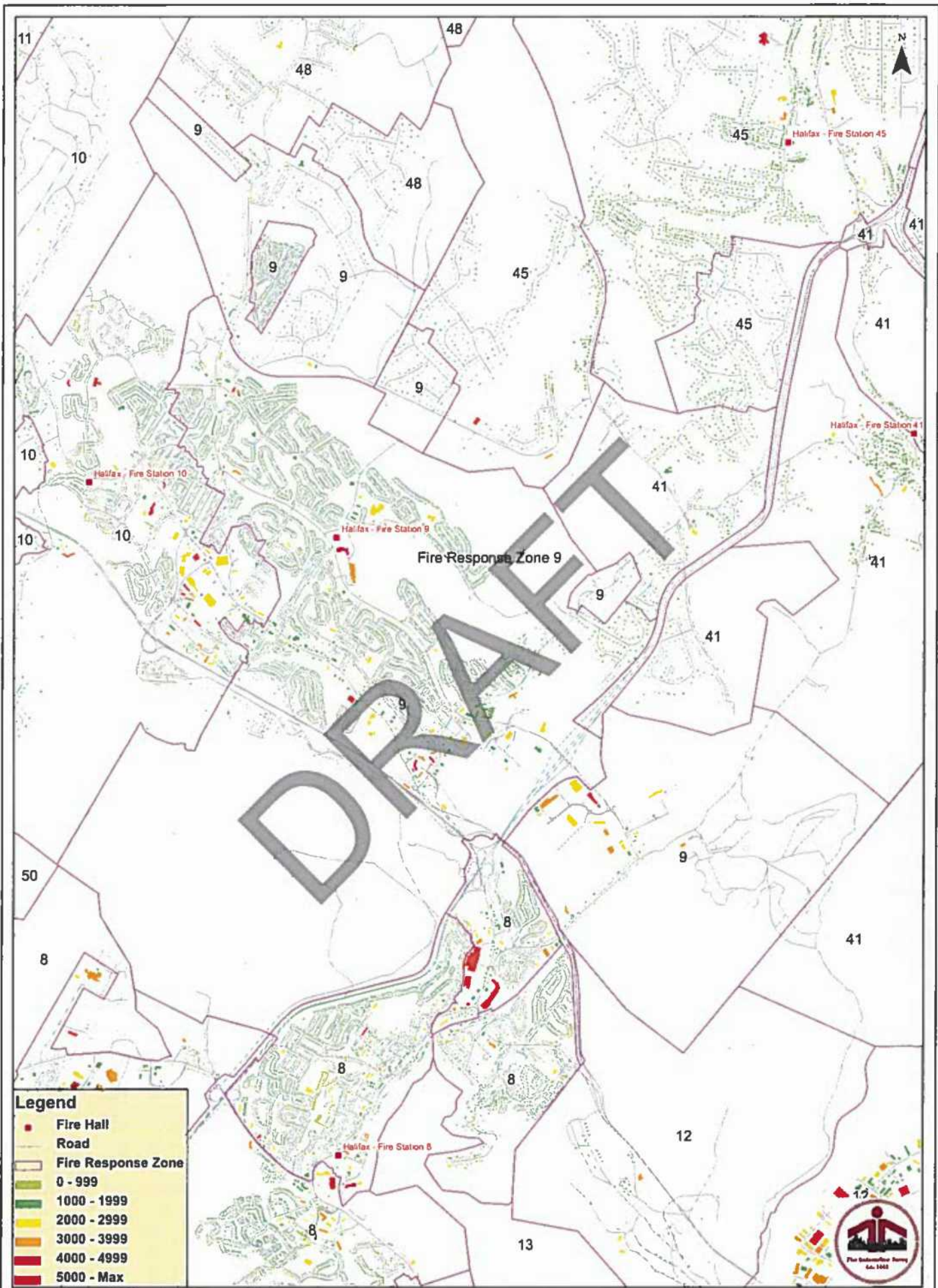
Community Risk Profile – Response Zone 9

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 7,261 Required Fire Flows were calculated for Response Zone 9 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 9

RFF Range	No. of RFF points
0-999 IGPM	1,105
1,000-1,999 IGPM	6,089
2,000-2,999 IGPM	44
3,000-3,999 IGPM	16
4,000-4,999 IGPM	4
>=5,000 IGPM	3





In addition the Basic Fire Flow was determined for the response area. The Basic Fire Flow is usually calculated as the 95th percentile RFF value or the 5th highest in the Fire Response Area. Considerations are given to the exposure risk, quantity of risks, and type of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response Zone 9 is based on the 5th highest which is 4,600 Imperial Gallons per Minute.

Table 2 Basic Fire Flows for HRM Response Zone 9

Total RFF Points	7,261	
	IGPM	L/s
90th Percentile	1,300	98.54
95th Percentile	1,400	106.12
Max	6,800	515.44
5th highest	4,600	348.68

Apparatus & Personnel

Standard staffing for Station 9 is a four person 24/7 shift with a complement of 37 volunteers. Apparatus assignment for Station 9 is one Quint.

Station 9 was evaluated for the number of Engine and Ladder companies in service relative to the overall fire potential and the area being protected. Apparatus are required to be adequately housed and staffed. Fire apparatus that serve dual purposes are evaluated based on the primary duty it serves on the fire ground. The Total Credited Engine Companies is calculated by [REDACTED]

[REDACTED] The credit may be downgraded from 100 percent based on reliability factors such as age, quality, listing, pump test results and distance.

Based on the Basic Fire Flow of 4,600 IGPM, the apparatus requirements for Fire Station 9 as defined in the Fire Underwriters Survey - Table of Effective Response is as follows:

- First due Pumper Company in 2.5 minutes.
- Second due Pumper Company in 4 minutes.



- First due Ladder Company in 3.5 minutes.

The benchmark number of apparatus required is 6 Pumper companies in 7.5 minutes and 2 Ladder companies in 5 minutes. These requirements reflect the apparatus need to attain maximum credit in the Engine and Ladder items of the fire department grading and serve as a benchmark against which response is measured. Ladders received 50 percent credit as Engine apparatus and 100 percent credit as Ladder apparatus. Fire Station 9 received credit for 5.09 Engines out of the maximum 6 Engine companies that can be credited for grading.

Table 3 Credited in Service Engine Summary

Station #	Vehicle Type	Apparatus Credit	Engine Credit	Reserve Engine Credit
9	Engine	100% Engine Credit	1	0
9	Quint	50% Engine Credit	0.5	0
10	Engine	73% Engine Credit	0.73	0
10	Engine	100% Engine Credit	1	0
41	Engine	73% Engine Credit	0.73	0
41	Engine	75% Engine Credit	0.75	0
41	Quint	38% Engine Credit	0.38	0
	Engine	100% Reserve Credit	0	1
Total Engine Credit:			5.09	1
Maximum Credit Receivable (4,600 Igpm):			6	1

Response areas with five buildings that are 3 storeys or 10 m (35 ft.) or more in height, or districts that have a Basic Fire Flow greater than 3,300 IGPM, or any combination of these criteria, should have a Ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed Ladder companies for fire insurance grading to receive maximum credit. There are multiple buildings within the HRM Response Zone 9 that are three storeys or more in height. In addition several of the calculated Required Fire Flows were greater than 3,300 IGPM. Currently there is one Quint stationed at Station 9. Fire Station 9 also received Support Ladder Credit for one Quint from Station 41. The credit received for Support Ladders was downgraded based on the distance from the responding hall. Station 9 received credit for 1.67 Ladder out of the maximum 2 Ladder companies that can be credited for grading.



Table 4 Credited in Service Ladder Summary

Station #	Vehicle Type	Apparatus Credit	Ladder Credit	Reserve Ladder Credit
41	Quint	67% Ladder Credit	0.67	0
9	Quint	100 % Ladder Credit	1	0
	Ladder	100% Reserve Credit	0	1
Total Ladder/Reserve Ladder Credit:			1.67	1
Maximum Credit Receivable (4,600 Igpm):			2	1

Staffing at Station 9 was evaluated in its ability to meet the staffing requirements as determined by the Basic Fire Flow benchmark from the Table of Effective Response. The total available fire force grading item is weighted heavily within the fire insurance grading of the fire department. The staffing was measured against the FUS benchmark of at least six competent career fire fighters available and assigned to respond to fire for duty with each required Engine and Ladder Company. The number of first due (initial response) engine companies and ladder companies based on the benchmark Basic Fire Flow of 4,600 IGPM is two Engine companies and one Ladder company. The maximum credit that Station 9 can receive for initial available fire force response for two engine companies and one Ladder company is 18 fire fighters. NFPA 1710 requires each fire apparatus to be staffed with a minimum of four personnel. The current initial response from Station 9 is one Quint staffed with four fire fighters. The station was therefore credited with four fire fighters available for initial response on first alarms out of the maximum 18 fire fighters that can be credited.

Station Location

Station 9 is well located for response. Figure 1 identifies the 2.5 km, 5 km and 8 km coverage areas for Station 9. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.



Fire calls

The historical calls for Station 9 cover a large area of the HRM. Figure 3 shows the response of Station 9 based on its historical calls for the years 2010 to September 2013. Station 9 responded to an average of 384 calls in the 45 months reviewed. The following table is a breakdown of the calls from 2010 to September 2013. The total for 2013 reflects the emergency calls for the first 9 months of the year. Table 6 shows the breakdown of emergency calls by incident type. The year average was calculated for all calls over the 45 months.

Table 5 Total Emergency calls per year

Total Calls per Year 2010 - 2013	
Year	No. of Calls
2010	393
2011	376
2012	401
2013	270

Table 6 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	243	65	16.9
False alarm	298	79	20.7
Smoke	253	67	17.6
Motor Vehicle Accident	279	74	19.4
Oil or Gas spill	22	6	1.5
Other	45	12	3.1
Rescue	5	1.3	0.3
Medical Assist	127	34	8.8
Coding	168	45	11.7



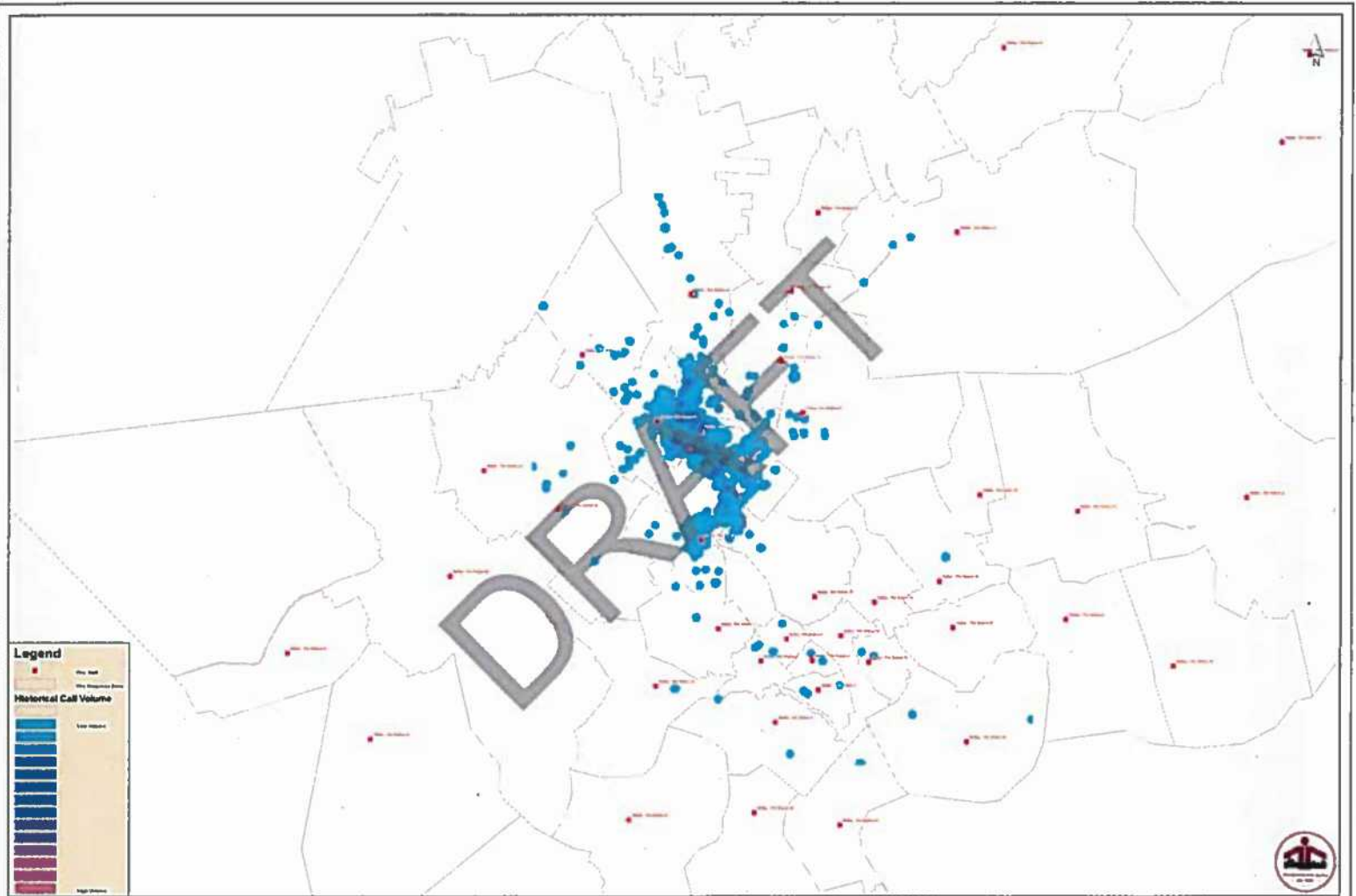
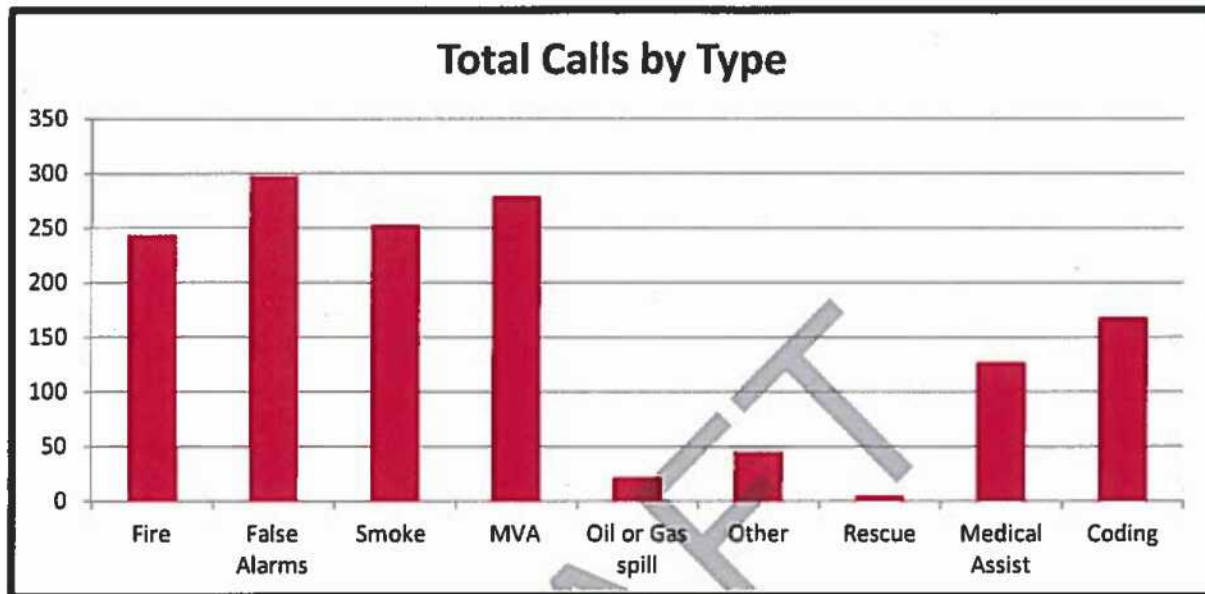


Figure 4 Emergency Calls by Incident Type (2010-2013)



The largest percentages of calls to Station 9 were False Alarm (detectors) fire calls and Motor vehicle accidents (MVA). Currently there is a fine applied to false alarms but it was found to be minimal. The resulting cost of time, apparatus and personnel responding to a fire alarm should be considered when determining applicable fines. The fines should be increased so as to deter false alarms and encourage building owners to maintain and repair fire alarm systems rather than pay a fine for a false alarm. For motor vehicle accidents, the fire department should submit their invoice for services provided as a result of an accident involving a motor vehicle or for a loss to a motor vehicle (i.e. fire) to the Province.

In reviewing the emergency call data it was noted that improvements need to be made in the call reporting procedure. HRM should implement a standard around the time stamping of fire calls and review each month for conformance with the standard and conformance with the "Service Delivery Standards for Halifax Regional Fire and Emergency" for all portions of the call listed in the service delivery standard.



Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Within the HRM Relative Classifications for Emergency Communications, Fire Prevention and Safety Control were determined and applied as a single grade across the entire city.

Relative Classifications for Fire Department and Water Supplies were calculated specifically for individual areas as follows:

- Relative Classification for each Fire District i.e. the primary geographic response zone for each fire station (52 stations in 2013).
- Relative Classification for each Major Pressure Zone (SCADA zone) (17 zones in 2013).

The Fire Department Assessment contributes 40 percent to the total Public Fire Protection Classification grade. This is the most heavily weighted portion of the grading and as such is considered to be the most significant indicator of a community or municipality's overall preparedness for dealing with fire emergencies.

[REDACTED] This forms the basis of the relative classification of the Fire Department.



Figure 5 Fire Department Item Weights

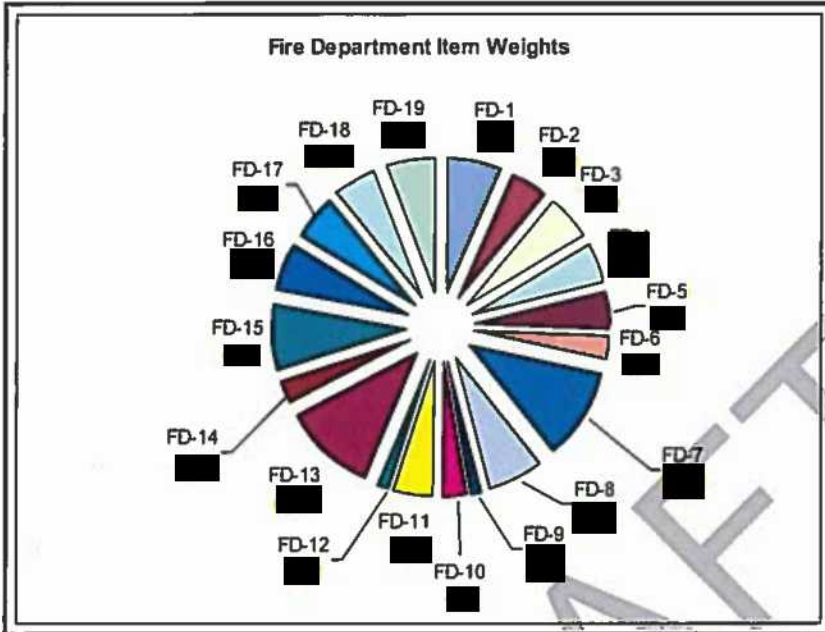


Figure 6 Fire Department Credit Points

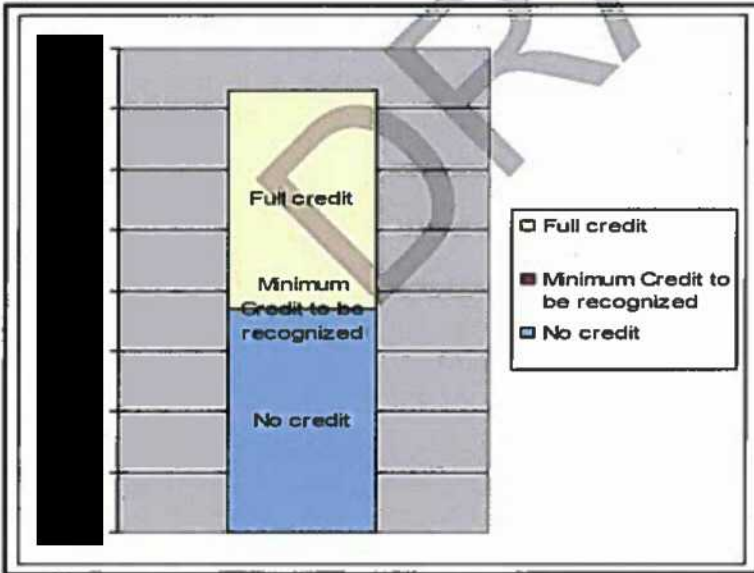
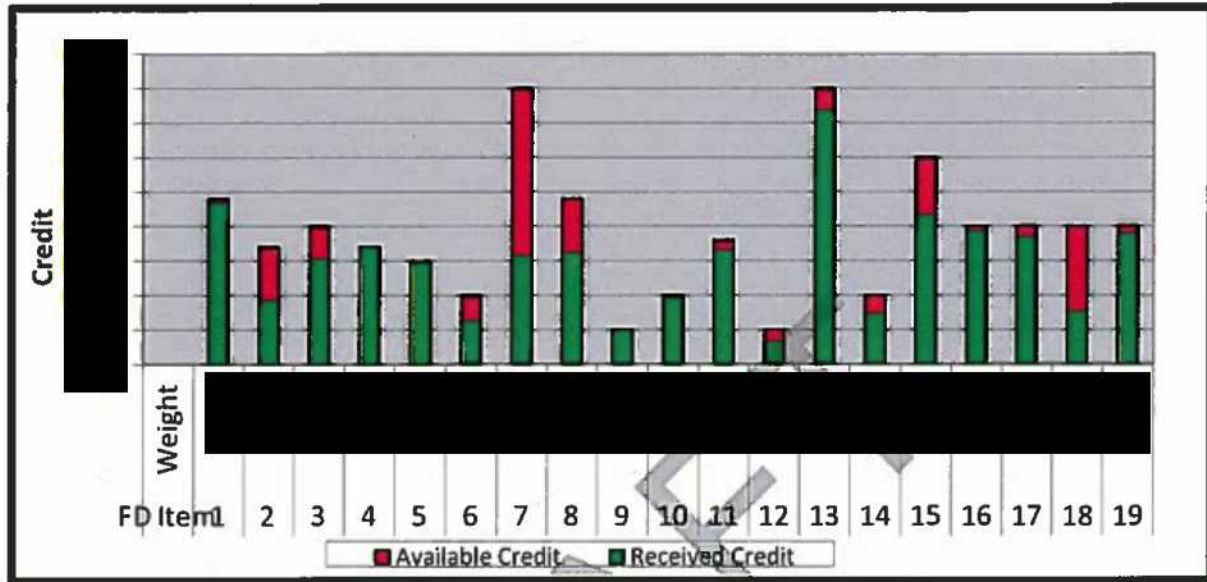


Table 7 Fire Department Grading Items Overall Summary

Grading Item	Category	Credit Received	Maximum Credit	% of FD	% of All
FD-1	Engine Service	215			
FD-2	Ladder Truck Service	160			
FD-3	Distribution of Companies and Type of Apparatus	195			
FD-4	Engine and Ladder Pump Capacity	170			
FD-5	Design, Maintenance and Condition of Apparatus	148			
FD-6	Number of Line Officers – Fire Suppression	64			
FD-7	Total Fire Force Available	158			
FD-8	Engine and Ladder Company Unit Manning	162			
FD-9	Master and Special Stream Devices	50			
FD-10	Equipment for Engines and Ladder Trucks, General	98			
FD-11	Fire Hose	166			
FD-12	Condition of Fire Hose	33			
FD-13	Training and Qualifications	369			
FD-14	Response to Alarms	74			
FD-15	Fire Ground Operations	217			
FD-16	Special Protection Required	194			
FD-17	Miscellaneous Factors and Conditions	185			
FD-18	Pre-Incident Planning	77			
FD-19	Administration	190			
Weight in Grading	40			Credit Received	21.86
Relative Classification					
5					



Figure 7 Fire Department Grading Items Overall Summary



Fire Station 9 was assigned a Relative Class of S. The figure above shows each grading item of the fire department and how much credit was received and how much credit is still available within each grading item. The relative classification contributes to the overall Public Fire Protection Classification (PFPC) of Fire District 9 and that of the entire Halifax Regional Municipality. Factoring in the Water Supply, Fire Safety Control and Emergency Communication grading items, Fire Station 9 was assigned an overall Public Fire Protection Classification of 4. This indicates that the level of response is proportionate to the level of risk in the fire protection district.

Maintaining the Public Fire Protection Classification for Station 9 will ensure residents within the fire protection area receive the full benefit of available property insurance premium discounts based on the level of fire protection provided. In the event the Station 9 is downgraded from a PFPC 4 to PFPC 5 the resulting cost to the tax payer in the form of insurance premiums is approximately \$1,800,000.00 in insurance rate increases for the zone. The estimated insurance savings should the grade improve to a PFPC 3 is approximately \$220,000. These values are estimates only as insurance rates are dynamic and dependent on a large number of factors. A further point to consider is that as the PFPC decreases in value, i.e. going from PFPC 5 to PFPC 4 the capacity of an insurer to underwrite in the City can change



and in turn can create competition which can lower rates. It is difficult to quantify the true effects and figures given here are estimates.

Table 8 Premium Estimates under the Public Fire Protection Classification System – Response Zone 9

Public Fire Protection Classification	Total Premium Estimates Prior to FUS Study	Total Premium Estimates Post FUS Study	Total Premium Estimates Difference
3			\$227,185
4	\$3,067,002	\$3,067,002	
5		\$4,685,698	\$1,618,696

Recommendations

- Review the option of relocating Station 9 to the intersection of Highway 102 and 101 as outlined in the Station 8 report. In the optimization of coverage analysis carried out for Station 8 it was determined that an option that should be considered is the relocation of Station 9 (along with the apparatus and staffing) to the intersection of Highway 102 and 101 while relocating Station 8 to Larry Utech drive area. This would address the requirement for ladders in both areas while eliminating the need for an increase in the overall staffing.



STATION 10
1156 Sackville drive



Station 10 is located at 1156 Sackville Drive in Sackville and is bordered by Sackville Drive to the north and a residential neighbourhood to the west and south. The station is located in a fairly central position for response to its overall coverage area. Figure 1 shows the 2.5 km, 5 km and 8 km coverage from Station 10.

Building and Tarmac

All fire stations should be of substantial construction, suitable for the service, and located and arranged for ease and quickness of response. Fire Station 10 is constructed of concrete block and the roof consists of steel trusses with a wood decking. The tarmac is an asphalt covered area which extends from the bay door to the street. The tarmac area is sufficient for vehicle run ups and day routines.



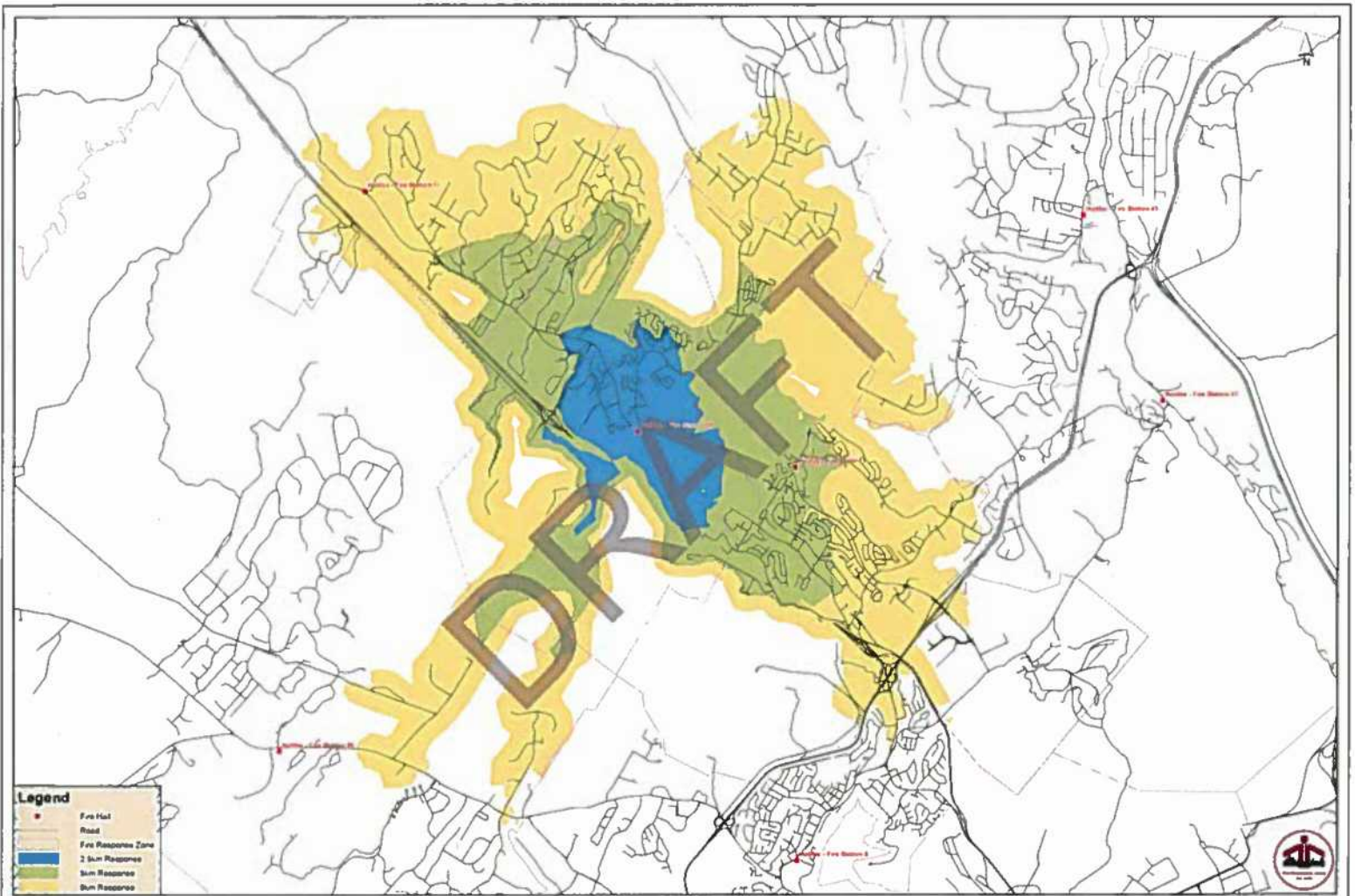


Figure 1.2.5/5km Response from Fire Station 10

Regional Municipality of Halifax

Scale = 1:10,000



Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. A kitchen area, sleeping quarters, a day room and a captain's office are located on the main floor of the building. Apparatus bays are located in the same building. The facilities at this station are adequate to meet the needs of the staff.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

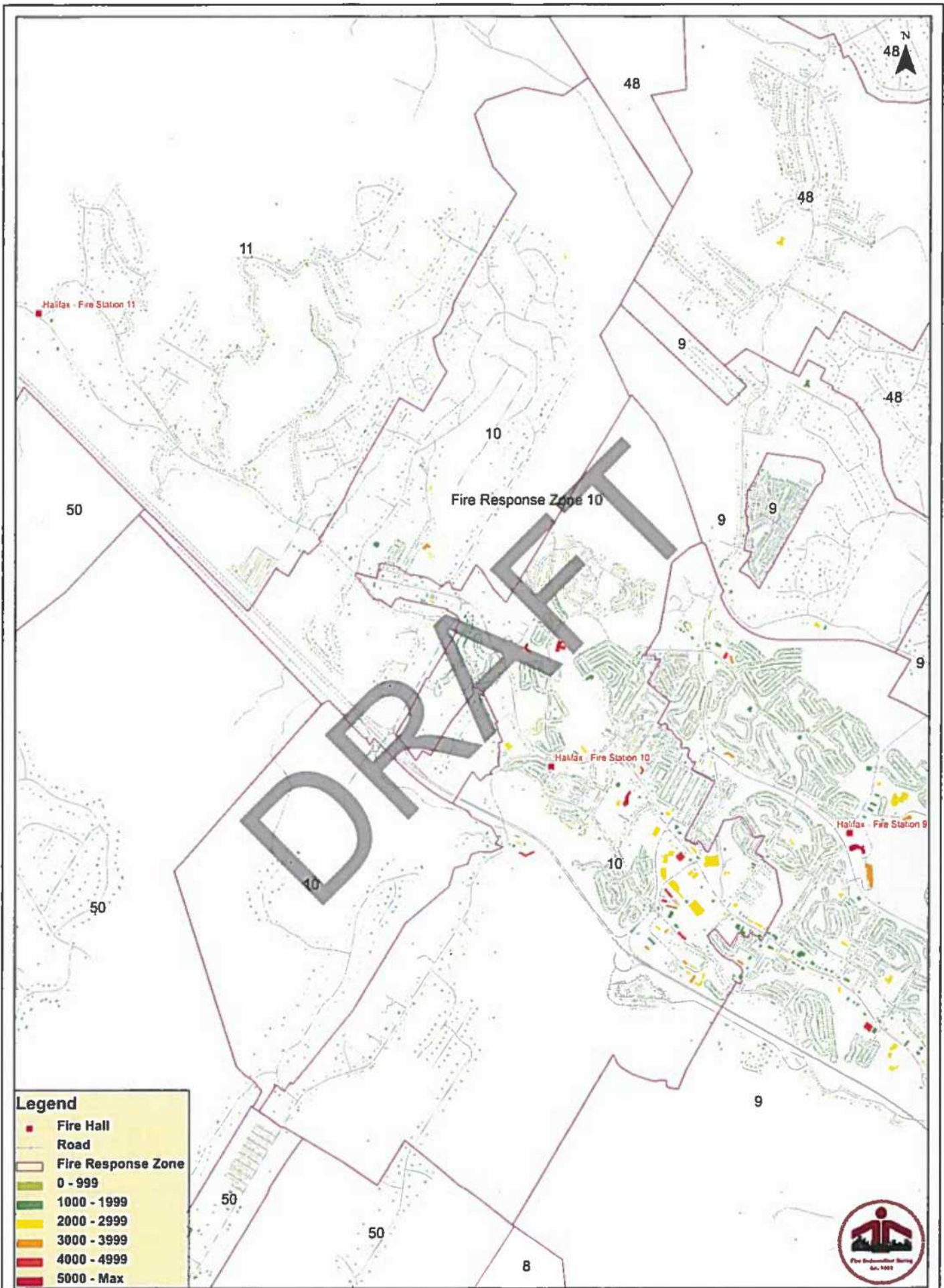
Community Risk Profile – Response Zone 10

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 4,716 Required Fire Flows were calculated for Response Zone 10 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 10

RFF Range	No. of RFF points
0-999 IGPM	1,957
1,000-1,999 IGPM	2,695
2,000-2,999 IGPM	47
3,000-3,999 IGPM	7
4,000-4,999 IGPM	10
>=5,000 IGPM	0





In addition the Basic Fire Flow was determined for the response area. The Basic Fire Flow is usually calculated as the 95th percentile RFF value or the 5th highest in the Fire Response Area. Considerations are given to the exposure risk, quantity of risks, and type of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response Zone 10 is based on the 95th percentile which is 1,400 Imperial Gallons per Minute.

Table 2 Basic Fire Flows for HRM Response Zone 10

Total RFF Points	4,716	
	IGPM	l/s
90th Percentile	1,200	90.96
95th Percentile	1,400	106.12
Max	4,900	371.42
5th highest	4,300	325.94

Apparatus & Personnel

Standard staffing for Station 10 is a 4 person 24/7 shift with a complement of 14 volunteer fire fighters. Apparatus assignment for Station 10 is one Engine and one Pumper/Tanker.

Station 10 was evaluated for the number of Engine and Ladder companies in service relative to the overall fire potential and the area being protected. Apparatus are required to be adequately housed and staffed. Fire apparatus that serve dual purposes are evaluated based on the primary duty it serves on the fire ground. The Total Credited Engine Companies is calculated by [REDACTED]

[REDACTED] The credit may be downgraded from 100 percent based on reliability factors such as age, quality, listing, pump test results and distance.

Based on the Basic Fire Flow of 1,400 IGPM, the apparatus requirements for Fire Station 10 as defined in the Fire Underwriters Survey - Table of Effective Response is as follows:

- First due Pumper Company in 3.5 minutes.
- Second due Pumper Company in 5 minutes.



- First due Ladder Company in 4 minutes (if required by hazards).

The benchmark number of apparatus required is 2 Pumper companies in 5 minutes and 1 Ladder companies in 4 minutes (if required by hazards). These requirements reflect the apparatus need to attain maximum credit in the Engine and Ladder items of the fire department grading and serve as a benchmark against which response is measured. Ladders received 50 percent credit as Engine apparatus and 100 percent credit as Ladder apparatus. Fire Station 10 received credit for 3 Engines out of the maximum 2 Engine companies that can be credited for grading.

Table 3 Credited in Service Engine Summary

Station #	Vehicle Type	Apparatus Credit	Engine Credit	Reserve Engine Credit
10	Engine	100% Engine Credit	1	0
10	Engine/Tanker	100% Engine Credit	1	0
9	Engine	100% Engine Credit	1	0
	Engine	100% Reserve Credit	0	1
Total Engine Credit:			3	1
Maximum Credit Receivable (1,400 Igpm):			2	1

Response areas with five buildings that are 3 storeys or 10 m (35 ft) or more in height, or districts that have a Basic Fire Flow greater than 3,300 IGPM, or any combination of these criteria, should have a Ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed Ladder companies for fire insurance grading to receive maximum credit. There are multiple buildings within the HRM Response Zone 10 that are three storeys or more in height. In addition several of the calculated Required Fire Flows were greater than 3,300 IGPM. Currently there is no Ladder stationed at Station 10. Fire Station 10 did not receive Ladder credit for those hazards requiring a Ladder.

Staffing at Station 10 was evaluated in its ability to meet the staffing requirements as determined by the Basic Fire Flow benchmark from the Table of Effective Response. The total available fire force grading item is weighted heavily within the fire insurance grading of the fire department. The staffing was measured against the FUS benchmark of at least six competent career fire fighters available and assigned to respond to fire for duty with each required Engine and Ladder Company. The number of first due (initial response) engine companies and ladder companies based on the benchmark Basic Fire Flow



of 1,400 IGPM is two Engine companies. The maximum credit that Station 10 can receive for initial available fire force response for two engine companies is 12 fire fighters. NFPA 1710 requires each fire apparatus to be staffed with a minimum of four personnel. The current initial response from Station 10 is one Engine staffed with four fire fighters. The station was therefore credited with four fire fighters available for initial response out of the maximum 12 fire fighters that can be credited.

Station Location

Station 10 is well located for response. Figure 1 identifies the 2.5 km, 5 km and 8 km coverage areas for Station 10. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

Fire calls

The historical calls for Station 10 cover a large area of the HRM. Figure 3 shows the response of Station 10 based on its historical calls for the years 2010 to 2013. Station 10 responded to an average of 258 calls in the 45 months reviewed. Table 4 is a breakdown of the calls from 2010 to September 2013. The calls per year numbers for 2013 reflect the first 9 months of 2013. Table 5 shows the breakdown of emergency calls by incident type. The year average was calculated for all calls over the 45 months.

Table 4 Total Emergency calls per year.

Total Calls per Year 2010 - 2013	
Year	No. of Calls
2010	297
2011	253
2012	237
2013	181



Table 5 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	150	40	15.5
False alarm	175	47	18.1
Smoke	168	45	17.4
Motor Vehicle Accident	249	66	25.7
Oil or Gas spill	15	4	1.5
Other	34	9	3.5
Rescue	2	0.5	0.2
Medical Assist	87	23	9.0
Coding	88	23	9.1

DRAFT



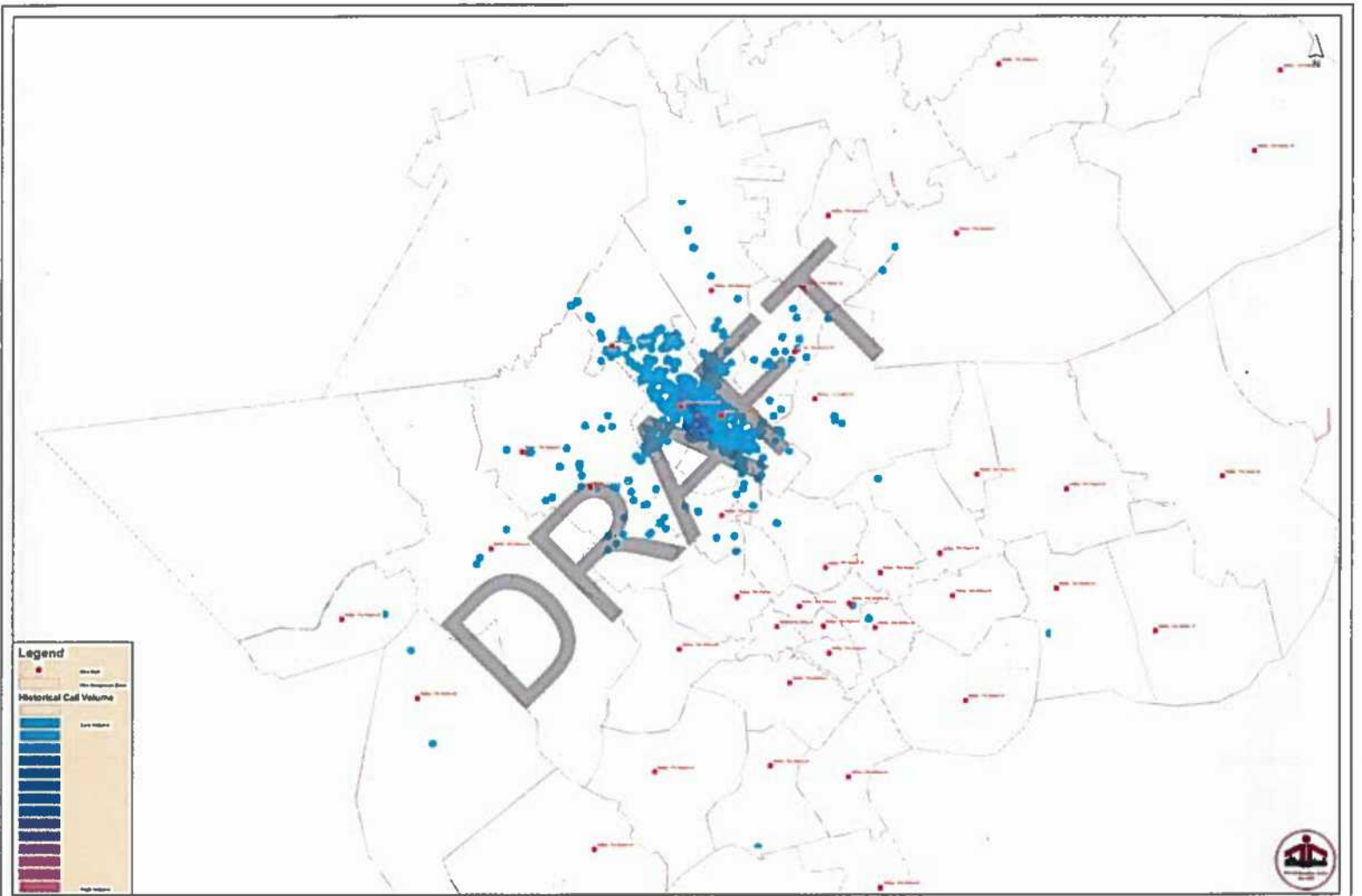
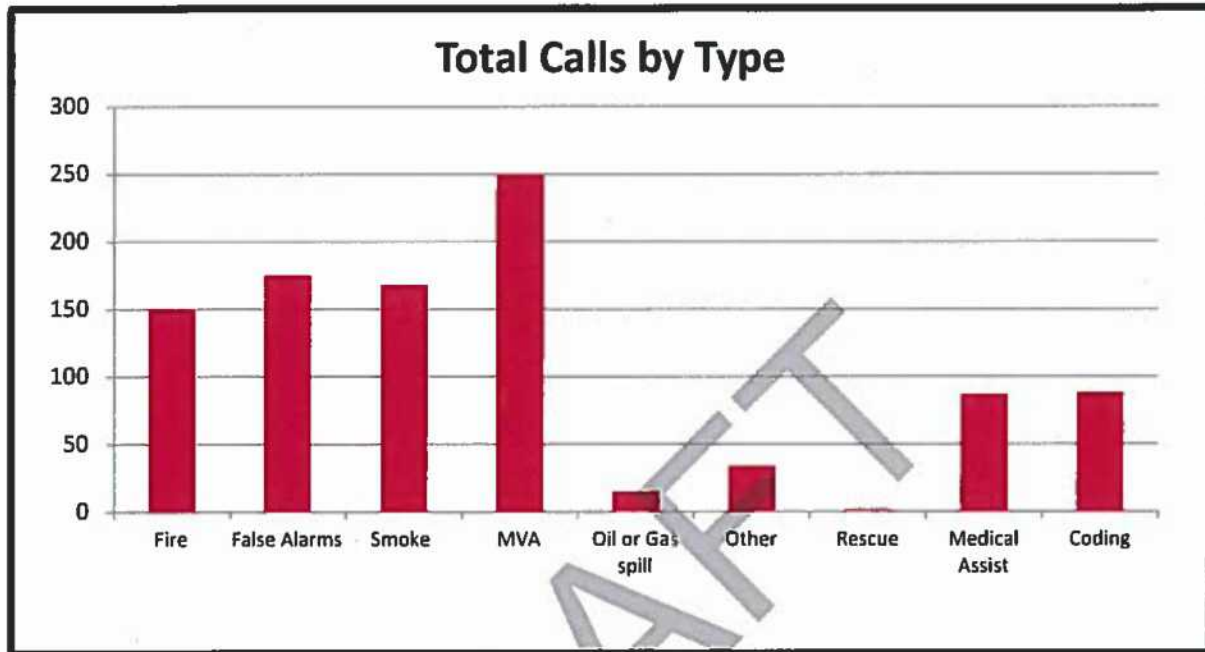


Figure 3 Historical Call Map - Fire Station 10

Figure 4 Emergency Calls by Incident Type (2010- 2013)



The largest percentage of calls to Station 10 was Motor vehicle accidents (MVA). For motor vehicle accidents, the fire department should submit their invoice for services provided as a result of an accident involving a motor vehicle or for a loss to a motor vehicle (i.e. fire) to the Province.

In reviewing the emergency call data it was noted that improvements need to be made in the call reporting procedure. HRM should implement a standard around the time stamping of fire calls and review each month for conformance with the standard and conformance with the "Service Delivery Standards for Halifax Regional Fire and Emergency" for all portions of the call listed in the service delivery standard.



Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Within the HRM Relative Classifications for Emergency Communications, Fire Prevention and Safety Control were determined and applied as a single grade across the entire city.

Relative Classifications for Fire Department and Water Supplies were calculated specifically for individual areas as follows:

- Relative Classification for each Fire District i.e. the primary geographic response zone for each fire station (52 stations in 2013).
- Relative Classification for each Major Pressure Zone (SCADA zone) (17 zones in 2013).

The Fire Department Assessment contributes 40 percent to the total Public Fire Protection Classification grade. This is the most heavily weighted portion of the grading and as such is considered to be the most significant indicator of a community or municipality's overall preparedness for dealing with fire emergencies.

[REDACTED] This forms the basis of the relative classification of the Fire Department.



Figure 5 Fire Department Item Weights

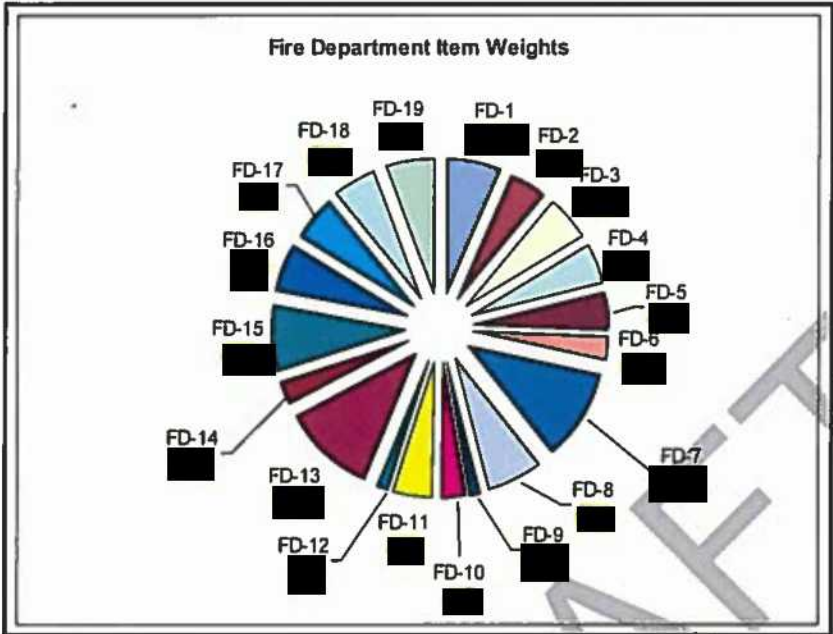


Figure 6 Fire Department Credit Points

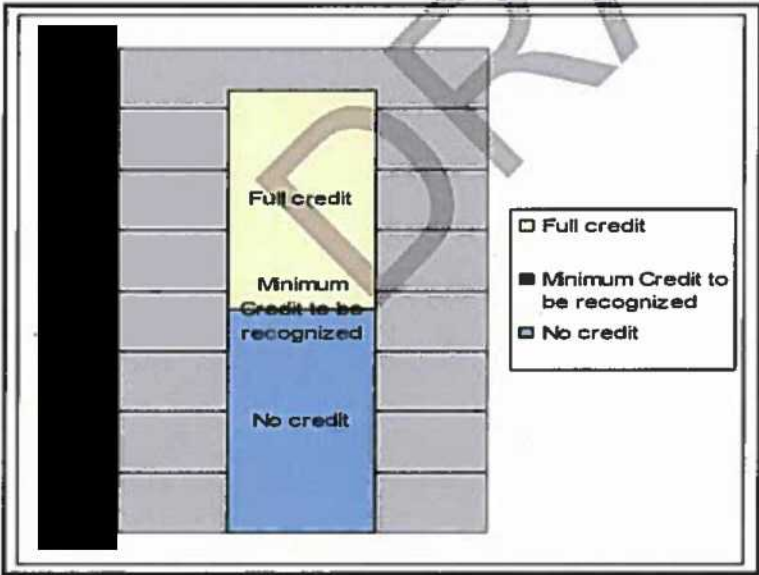
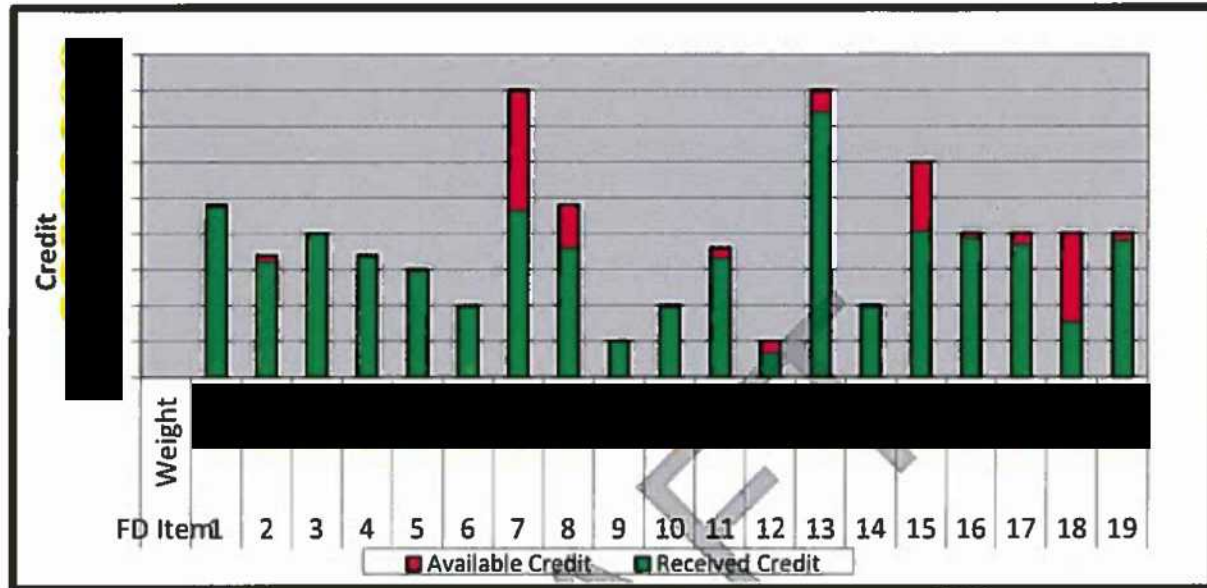


Table 6 Fire Department Grading Items Overall Summary

Grading Item	Category	Credit Received	Maximum Credit	% of FD	% of All
FD-1	Engine Service	215			
FD-2	Ladder Truck Service	161			
FD-3	Distribution of Companies and Type of Apparatus	200			
FD-4	Engine and Ladder Pump Capacity	170			
FD-5	Design, Maintenance and Condition of Apparatus	148			
FD-6	Number of Line Officers – Fire Suppression	100			
FD-7	Total Fire Force Available	232			
FD-8	Engine and Ladder Company Unit Manning	180			
FD-9	Master and Special Stream Devices	50			
FD-10	Equipment for Engines and Ladder Trucks, General	98			
FD-11	Fire Hose	165			
FD-12	Condition of Fire Hose	33			
FD-13	Training and Qualifications	369			
FD-14	Response to Alarms	100			
FD-15	Fire Ground Operations	204			
FD-16	Special Protection Required	194			
FD-17	Miscellaneous Factors and Conditions	185			
FD-18	Pre-Incident Planning	77			
FD-19	Administration	190			
Weight in Grading	40			Credit Received	27.67
Relative Classification					
4					



Figure 7 Fire Department Grading Items Overall Summary



Fire Station 10 was assigned a Relative Class of 4. The figure above shows each grading item of the fire department and how much credit was received and how much credit is still available within each grading item. The relative classification contributes to the overall Public Fire Protection Classification (PFPC) of Fire District 10 and that of the entire Halifax Regional Municipality. Factoring in the Water Supply, Fire Safety Control and Emergency Communication grading items, Fire Station 10 was assigned an overall Public Fire Protection Classification of 4. This indicates that the level of response is proportionate to the level of risk in the fire protection district. To improve the firefighting capabilities and increase the credit received for fire insurance grading purposes, it is recommended that a minimum of four career fire fighters be maintained at Station 10.

Maintaining the Public Fire Protection Classification for Station 10 will ensure residents within the fire protection area receive the full benefit of available property insurance premium discounts based on the level of fire protection provided. In the event the Station 10 is downgraded from a PFPC 4 to PFPC 5 the resulting cost to the tax payer in the form of insurance premiums is approximately \$900,000.00 in insurance premium increases for the zone. The estimated insurance savings should the grade improve to a PFPC 3 is approximately \$110,000. These values are estimates only as insurance rates are dynamic and dependent on a large number of factors. A further point to consider is that as the PFPC decreases in



value, i.e. going from PFPC 5 to PFPC 4 the capacity of an insurer to underwrite in the City can change and in turn can create competition which may lower rates. It is difficult to quantify the true effects and figures given here are estimates.

Table 7 Premium Estimates under the Public Fire Protection Classification System – Response Zone 10

Public Fire Protection Classification	Total Premium Estimates Prior to FUS Study	Total Premium Estimates Post FUS Study	Total Premium Estimates Difference
3			\$114,867
4	\$1,550,709	\$1,550,709	
5		\$2,484,006	\$933,297

Recommendations

- Maintain a minimum of four career fire fighters at Station 10.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 11

479 Patton Road



Station 11 is located at 479 Patton Road in Sackville and is bordered by Patton Road to the south and Sackville Drive to the west. The station is located in a fairly central position for response to its overall coverage area. Figure 1 shows the 2.5 km, 5 km and 8 km coverage from Station 11.

Building and Tarmac

All fire stations should be of substantial construction, suitable for the service, and located and arranged for ease and quickness of response. Fire Station 11 is a single storey wood-frame structure and the roof covering is a modified bitumen system installed over asphalt shingles. The tarmac is an asphalt covered area which extends from the bay door to the street. The tarmac area is sufficient for vehicle run ups and day routines.



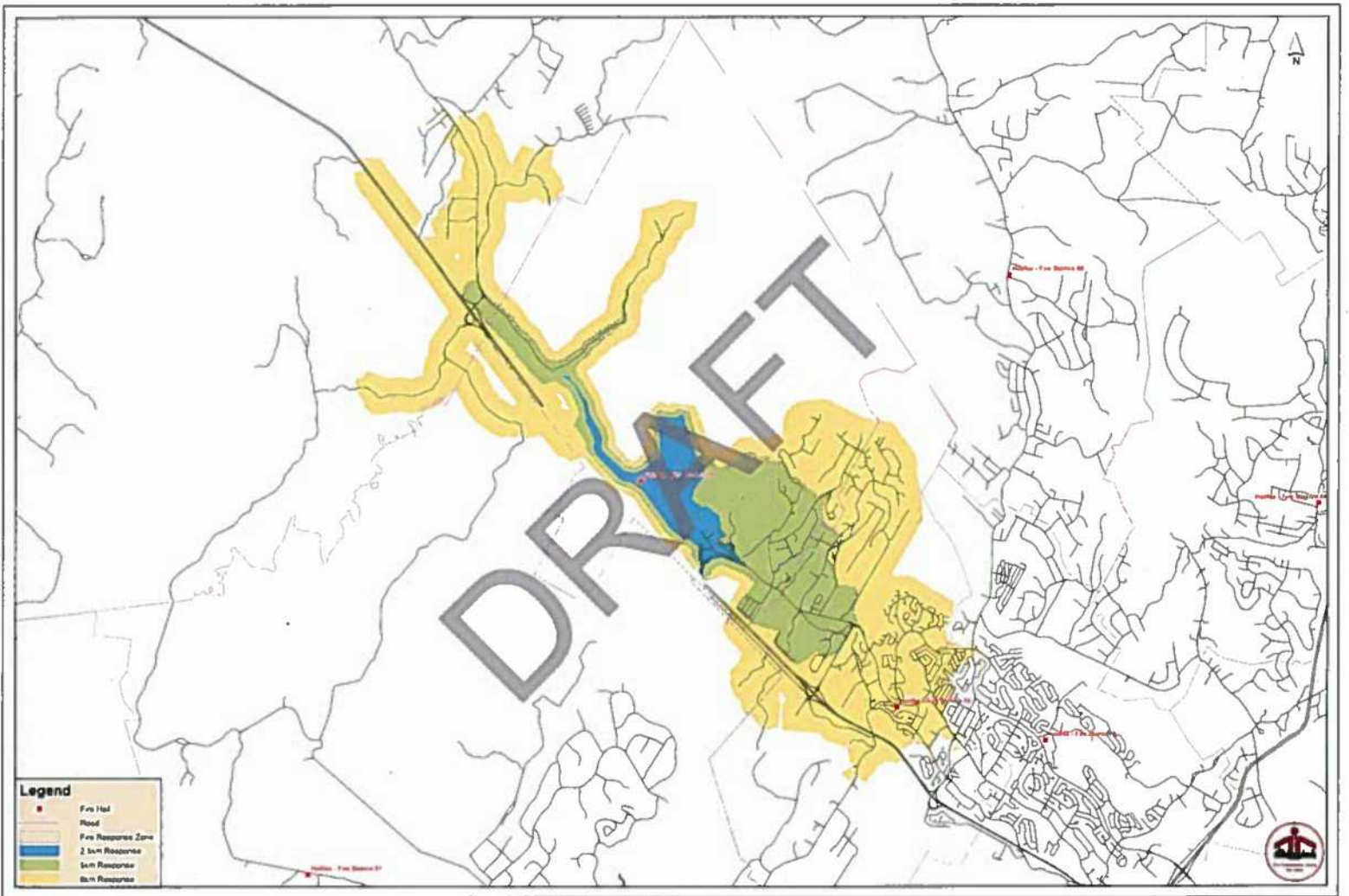


Figure 1 - 2.5/5/8km Response from Fire Station 11

Regional Municipality of Halifax

Scale = 1:20,000



Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The building consists of an apparatus bay, a fitness area, kitchen, sleeping quarters, a day room and a captain's office. The facilities at this station are adequate to meet the needs of the staff.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

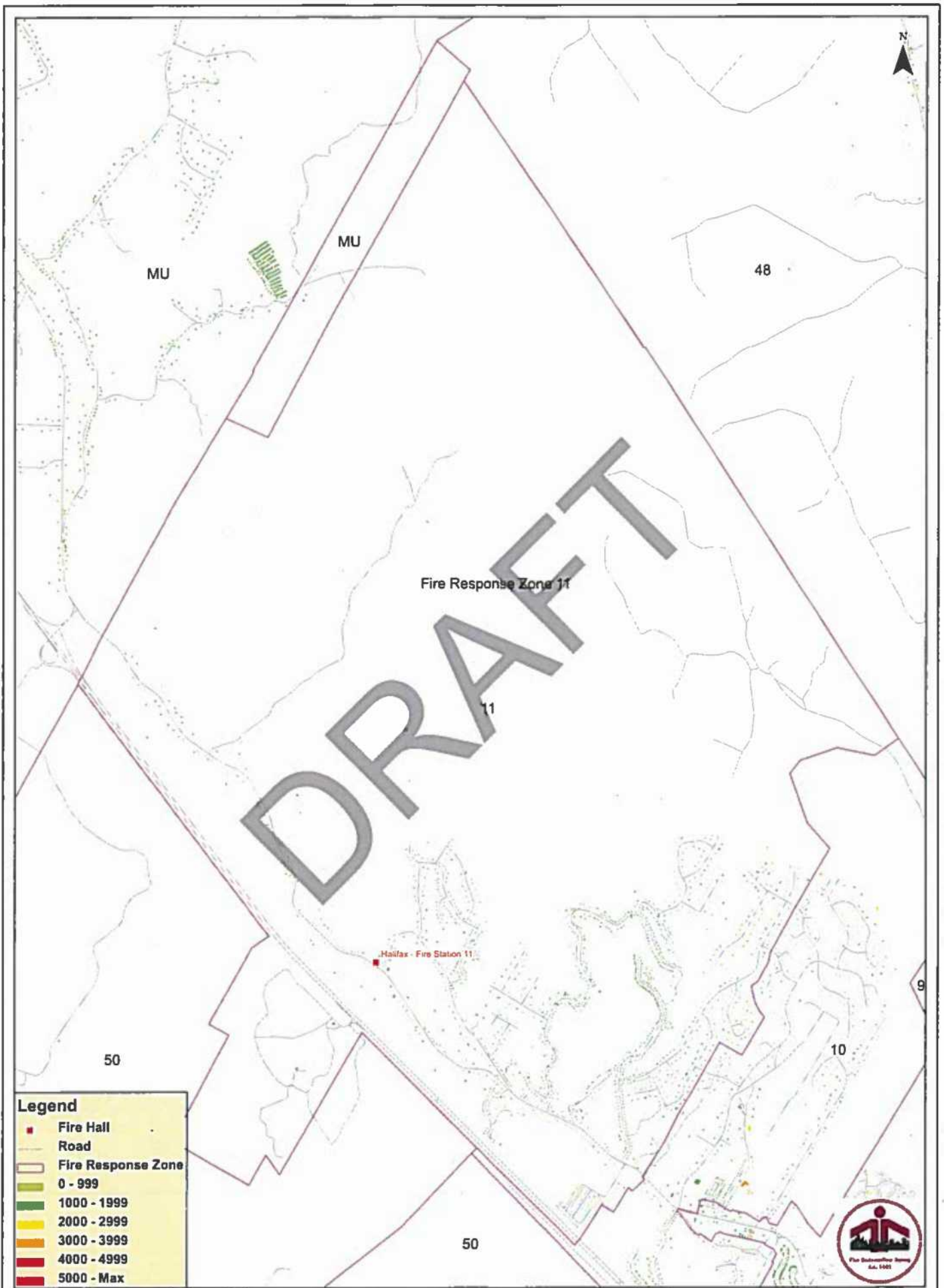
Community Risk Profile – Response Zone 11

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 1,689 Required Fire Flows were calculated for Response Zone 11 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 11

RFF Range	No. of RFF points
0-999 IGPM	681
1,000-1,999 IGPM	1,008
2,000-2,999 IGPM	0
3,000-3,999 IGPM	0
4,000-4,999 IGPM	0
>=5,000 IGPM	0





In addition the Basic Fire Flow was determined for the response area. The Basic Fire Flow is usually calculated as the 95th percentile RFF value or the 5th highest in the Fire Response Area. Considerations are given to the exposure risk, quantity of risks, and type of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The 90th Percentile is used in areas with lower exposures and fewer hazards. The Basic Fire Flow for Response Zone 11 is based on the 90th Percentile which is 1,200 Imperial Gallons per Minute.

Table 2 Basic Fire Flows for HRM Response Zone 11

Total RFF Points	1,689	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,400	106.12
Max	1,900	144.02
5th highest	1,700	128.86

Apparatus & Personnel

Standard staffing for Station 11 is a 2 person 24/7 shift. Apparatus assignment for Station 11 is a Pumper/Tanker.

Station 11 was evaluated for the number of Engine and Ladder companies in service relative to the overall fire potential and the area being protected. Apparatus are required to be adequately housed and staffed. Fire apparatus that serve dual purposes are evaluated based on the primary duty it serves on the fire ground. The Total Credited Engine Companies is calculated [REDACTED]

[REDACTED] The credit may be downgraded from 100 percent based on reliability factors such as age, quality, listing, pump test results and distance.

Based on the Basic Fire Flow of 1,200 IGPM, the apparatus requirements for Fire Station 11 as defined in the Fire Underwriters Survey - Table of Effective Response is as follows:

- First due Pumper Company in 3.5 minutes.
- Second due Pumper Company in 4 minutes.

February 2015



The benchmark number of apparatus required is 2 Pumper companies in 5 minutes. These requirements reflect the apparatus need to attain maximum credit in the Engine and Ladder items of the fire department grading and serve as a benchmark against which response is measured. Fire Station 11 received credit for 1.76 Engines out of the maximum 2 Engine companies that can be credited for grading.

Table 3 Credited in Service Engine Summary

Station #	Vehicle Type	Apparatus Credit	Engine Credit	Reserve Engine Credit
11	Pumper/Tanker	100% Engine Credit	1	0
10	Engine	38% Engine Credit	0.38	0
10	Pumper/Tanker	38% Engine Credit	0.38	0
	Engine	100% Reserve Credit	0	1
Total Engine Credit:			1.76	1
Maximum Credit Receivable (1,200 l/gpm):			2	1

Response areas with five buildings that are 3 storeys or 10 m (35 ft) or more in height, or districts that have a Basic Fire Flow greater than 3,300 IGPM, or any combination of these criteria, should have a Ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed Ladder companies for fire insurance grading to receive maximum credit. There is no Ladder requirement for Response Zone 11.

Staffing at Station 11 was evaluated in its ability to meet the staffing requirements as determined by the Basic Fire Flow benchmark from the Table of Effective Response. The total available fire force grading item is weighted heavily within the fire insurance grading of the fire department. The staffing was measured against the FUS benchmark of at least six competent career fire fighters available and assigned to respond to fire for duty with each required Engine and Ladder Company. The number of first due (initial response) engine companies and ladder companies based on the benchmark Basic Fire Flow of 1,200 IGPM is two Engine companies. The maximum credit that Station 11 can receive for initial available fire force response for two engine companies is 12 fire fighters. NFPA 1710 requires each fire apparatus to be staffed with a minimum of four personnel. The current initial response from Station 11 is one Engine staffed with two fire fighters. The station was therefore credited with two fire fighters available for initial response out of the maximum 12 fire fighters that can be credited. A roster of two fire fighters is below the minimum of four full-time staff required to provide adequate response. This



poses a major liability issue for the responding fire hall. Where there are insufficient numbers, the safety and performance of personnel at a fire scene is compromised.

Station Location

Figure 1 identifies the 2.5km, 5km and 8km coverage areas for Station 11. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

Fire calls

Figure 3 shows the response of Station 11 based on its historical calls for the years 2010 to 2013. Station 11 responded to an average of 41 calls per year in the 45 months reviewed. Table 4 is a breakdown of the calls from 2010 to September 2013. The total for 2013 reflects the emergency calls for the first 9 months of the year. Table 5 shows the breakdown of emergency calls by incident type. The year average was calculated for all calls over the 45 months.

Table 4 Total Emergency calls per year.

Total Calls per Year 2010 - 2013	
Year	No. of Calls
2010	39
2011	34
2012	49
2013	35

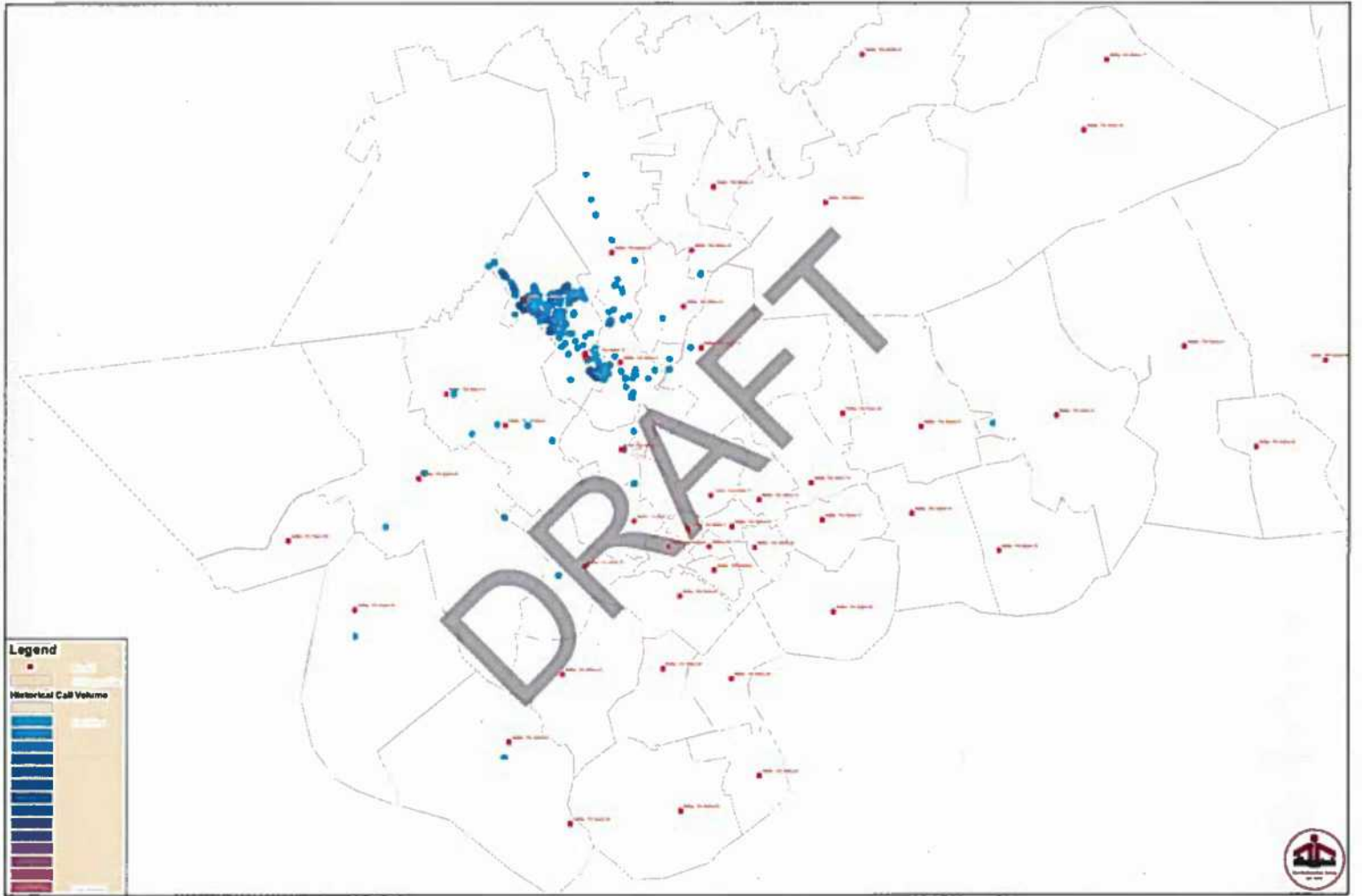


Table 5 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	33	9	21.0
False alarm	26	7	16.6
Smoke	24	6	15.3
Motor Vehicle Accident	42	11	26.8
Oil or Gas spill	0	0	0.0
Other	6	1.6	3.8
Rescue	1	0.3	0.6
Medical Assist	12	3	7.6
Coding	13	3	8.3

There were considerably fewer calls to Station 11 as compared to the neighbouring stations. The majority of calls to this station were motor vehicle accidents and medical calls. Personnel would be better utilized by reassigning them to Station 10.





1000'

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Within the HRM Relative Classifications for Emergency Communications, Fire Prevention and Safety Control were determined and applied as a single grade across the entire city.

Relative Classifications for Fire Department and Water Supplies were calculated specifically for individual areas as follows:

- Relative Classification for each Fire District i.e. the primary geographic response zone for each fire station (52 stations in 2013).
- Relative Classification for each Major Pressure Zone (SCADA zone) (17 zones in 2013).

The Fire Department Assessment contributes 40 percent to the total Public Fire Protection Classification grade. This is the most heavily weighted portion of the grading and as such is considered to be the most significant indicator of a community or municipality's overall preparedness for dealing with fire emergencies.

[REDACTED]

[REDACTED] This forms the basis of the relative classification of the Fire Department.



Figure 4 Fire Department Item Weights

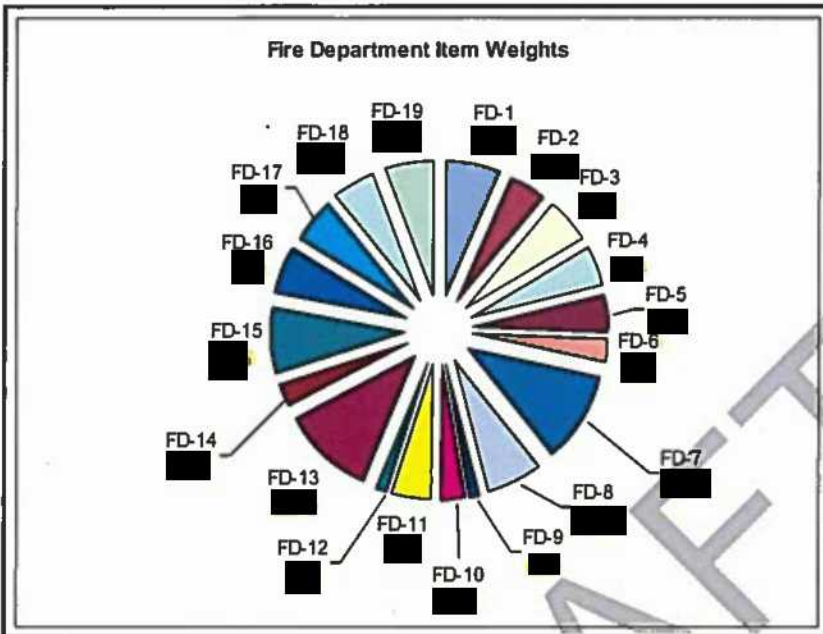


Figure 5 Fire Department Credit Points

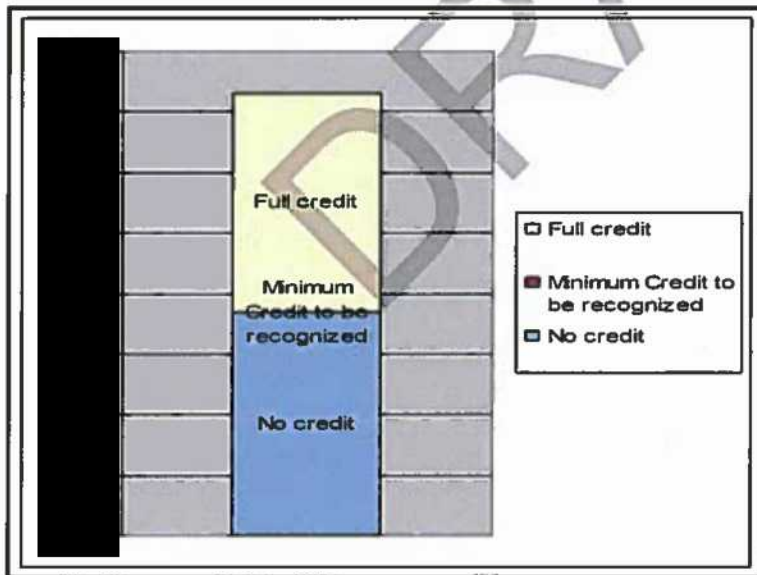
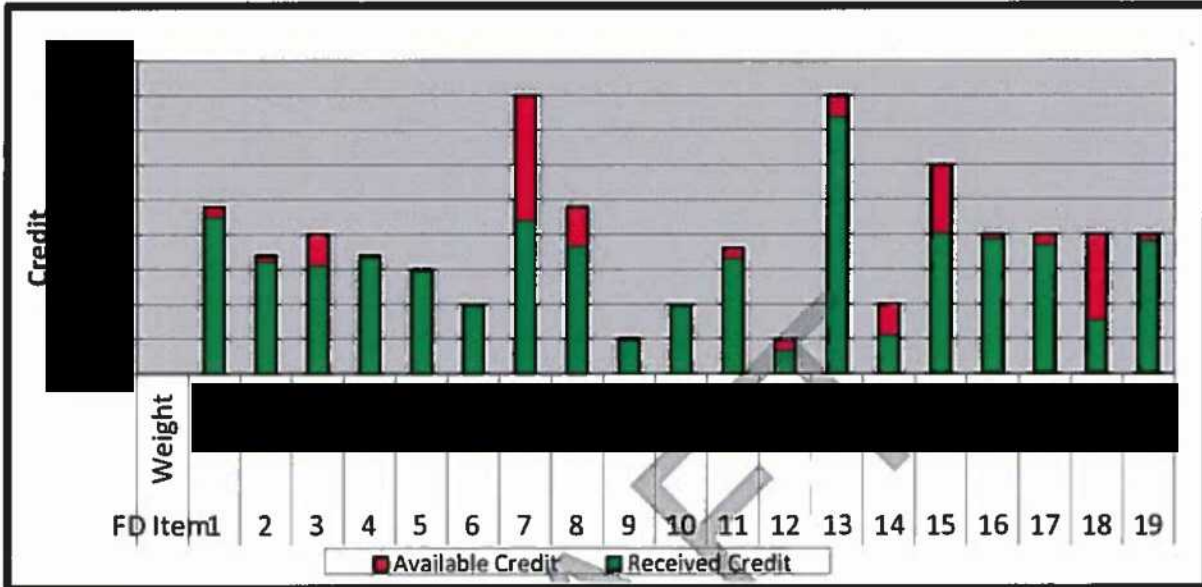


Table 6 Fire Department Grading Items Overall Summary

Grading Item	Category	Credit Received	Maximum Credit	% of FD	% of All
FD-1	Engine Service	225			
FD-2	Ladder Truck Service	161			
FD-3	Distribution of Companies and Type of Apparatus	155			
FD-4	Engine and Ladder Pump Capacity	170			
FD-5	Design, Maintenance and Condition of Apparatus	148			
FD-6	Number of Line Officers – Fire Suppression	97			
FD-7	Total Fire Force Available	220			
FD-8	Engine and Ladder Company Unit Manning	183			
FD-9	Master and Special Stream Devices	50			
FD-10	Equipment for Engines and Ladder Trucks, General	98			
FD-11	Fire Hose	166			
FD-12	Condition of Fire Hose	33			
FD-13	Training and Qualifications	369			
FD-14	Response to Alarms	55			
FD-15	Fire Ground Operations	202			
FD-16	Special Protection Required	194			
FD-17	Miscellaneous Factors and Conditions	185			
FD-18	Pre-Incident Planning	77			
FD-19	Administration	190			
Relative Classification					
4					
Weight in Grading	40			Credit Received	25.03



Figure 6 Fire Department Grading Items Overall Summary



Fire Station 11 was assigned a Relative Class of 4. The figure above shows each grading item of the fire department and how much credit was received and how much credit is still available within each grading item. The relative classification contributes to the overall Public Fire Protection Classification (PFPC) of Fire District 11 and that of the entire Halifax Regional Municipality. Factoring in the Water Supply, Fire Safety Control and Emergency Communications grading items, Fire Station 11 was assigned an overall Public Fire Protection Classification of 4.

Based on the current staffing levels and number of emergency calls to Station 11, it recommended that Station 11 be closed. Operating this station presents an undue cost with no corresponding insurance savings.

Recommendations

- Close Station 11 and relocate staffing and apparatus to Station 10.



STATION 12
45 Highfield Park Drive



Station 12 is located at 45 Highfield Park Drive in Dartmouth and is bordered by Highfield Park Drive to the north, Joseph Young Street to the east and residential apartments to the west and south. The station is located in a fairly central position for response to its overall coverage area. Figure 1 shows the 2.5 km, 5 km and 8 km coverage from Station 12.

Building and Tarmac

All fire stations should be of substantial construction, suitable for the service, and located and arranged for ease and quickness of response. Fire Station 12 is divided into three sections – east, center and west. The building is constructed of concrete block and the roof consists of a metal roof covering. The tarmac is an asphalt covered area which extends from the bay door to the street. The tarmac area is sufficient for vehicle run ups and day routines.



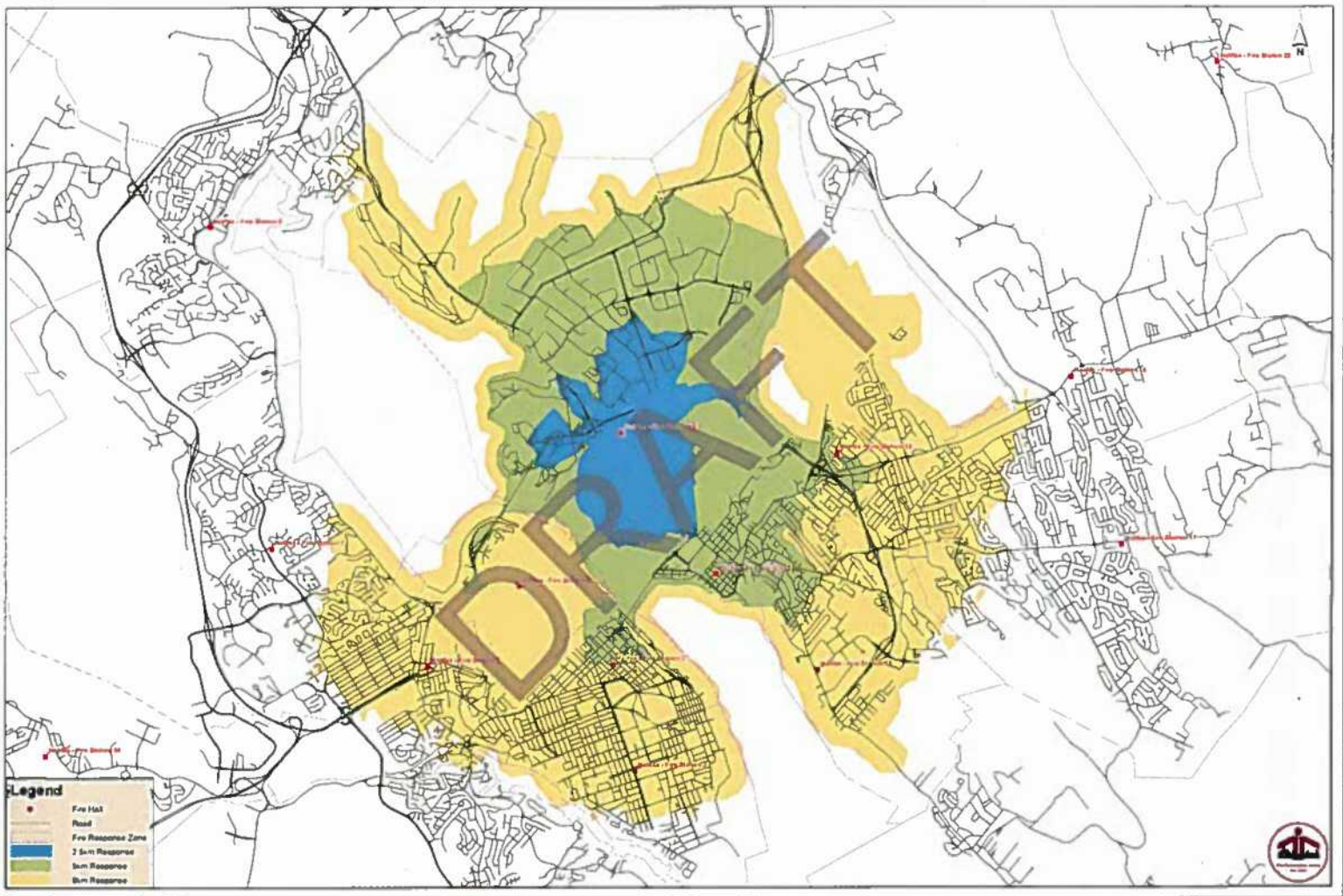


Figure 1.2 5/5/0km Response from Fire Station 12

Scale = 1:10,000

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. A kitchen area, sleeping quarters, a day room and a captain's office are located in the building. Apparatus bays are located in the same building. The facilities at this station are adequate to meet the needs of the staff.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

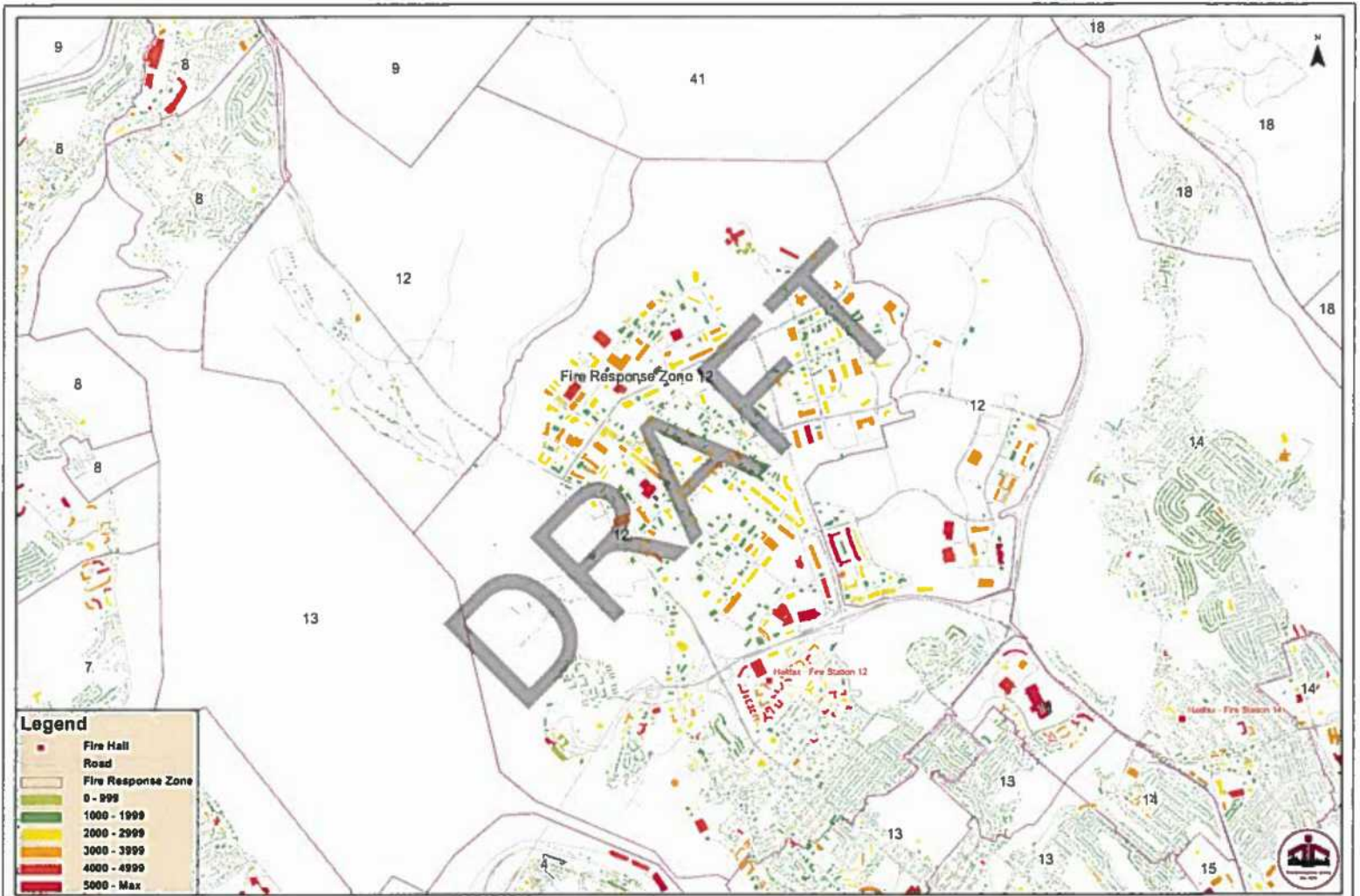
Community Risk Profile – Response Zone 12

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 3,225 Required Fire Flows were calculated for Response Zone 12 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 12

RFF Range	No. of RFF points
0-999 IGPM	935
1,000-1,999 IGPM	1,927
2,000-2,999 IGPM	238
3,000-3,999 IGPM	76
4,000-4,999 IGPM	41
>=5,000 IGPM	8





In addition the Basic Fire Flow was determined for the response area. The Basic Fire Flow is usually calculated as the 95th percentile RFF value or the 5th highest in the Fire Response Area. Considerations are given to the exposure risk, quantity of risks, and type of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response Zone 12 is based on the 5th highest which is 5,300 Imperial Gallons per Minute.

Table 2 Basic Fire Flows for HRM Response Zone 12

Total RFF Points	3,225	
	IGPM	l/s
90th Percentile	2,100	159.18
95th Percentile	2,800	212.24
Max	6,700	507.86
5th highest	5,300	401.74

Apparatus & Personnel

Standard staffing for Station 12 is a 6 person 24/7 shift. Apparatus assignment for Station 12 is one Quint and a tactical support unit.

Station 12 was evaluated for the number of Engine and Ladder companies in service relative to the overall fire potential and the area being protected. Apparatus are required to be adequately housed and staffed. Fire apparatus that serve dual purposes are evaluated based on the primary duty it serves on the fire ground. The Total Credited Engine Companies is calculated [REDACTED]

[REDACTED] The credit may be downgraded from 100 percent based on reliability factors such as age, quality, listing, pump test results and distance.

Based on the Basic Fire Flow of 5,300 IGPM, the apparatus requirements for Fire Station 12 as defined in the Fire Underwriters Survey - Table of Effective Response is as follows:

- First due Pumper Company in 2.5 minutes.
- Second due Pumper Company in 4 minutes.



- First due Ladder Company in 3.5 minutes.

The benchmark number of apparatus required is 6 Pumper companies in 7.5 minutes and 2 Ladder companies in 5 minutes. These requirements reflect the apparatus need to attain maximum credit in the Engine and Ladder items of the fire department grading and serve as a benchmark against which response is measured. Ladders received 50 percent credit as Engine apparatus and 100 percent credit as Ladder apparatus. Fire Station 12 received credit for 4.5 Engines out of the maximum 6 Engine companies that can be credited for grading.

Table 3 Credited in Service Engine Summary

Station #	Vehicle Type	Apparatus Credit	Engine Credit	Reserve Engine Credit
12	Quint	50% Engine Credit	0.5	0
13	Quint	46% Engine Credit	0.46	0
14	Engine	100% Engine Credit	1	0
3	Engine	100% Engine Credit	1	0
3	Aerial	50% Engine Credit	0.5	0
4	Engine	100% Engine Credit	1	0
Total Engine Credit:			4.46	1
Maximum Credit Receivable (5,300 lpm):			6	1

Response areas with five buildings that are 3 storeys or 10 m (35 ft) or more in height, or districts that have a Basic Fire Flow greater than 3,300 IGPM, or any combination of these criteria, should have a Ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed Ladder companies for fire insurance grading to receive maximum credit. There are multiple buildings within the HRM Response Zone 12 that are three storeys or more in height. In addition several of the calculated Required Fire Flows were greater than 3,300 IGPM. Currently there is one Quint stationed at Station 12. As shown in Table 4 below, the credit received for fire insurance grading is 2.92 Ladder companies out of a maximum 2 Ladder companies.



Table 4 Credited in Service Ladder Summary

Station #	Vehicle Type	Apparatus Credit	Ladder Credit	Reserve Ladder Credit
12	Quint	100% Ladder Credit	1	0
13	Quint	92% Ladder Credit	0.92	0
3	Aerial	100% Ladder Credit	1	1
Total Ladder/Reserve Ladder Credit:			2.92	1
Maximum Credit Receivable (5,300 lpgm):			2	1

Staffing at Station 12 was evaluated in its ability to meet the staffing requirements as determined by the Basic Fire Flow benchmark from the Table of Effective Response. The total available fire force grading item is weighted heavily within the fire insurance grading of the fire department. The staffing was measured against the FUS benchmark of at least six competent career fire fighters available and assigned to respond to fire for duty with each required Engine and Ladder Company. The number of first due (initial response) engine companies and ladder companies based on the benchmark Basic Fire Flow of 5,300 IGPM is two Engine companies and one Ladder company. The maximum credit that Station 12 can receive for initial available fire force response for two engine companies is 18 fire fighters. NFPA 1710 requires each fire apparatus to be staffed with a minimum of four personnel. The current initial response from Station 12 is six fire fighters. The station was therefore credited with six fire fighters available for initial response out of the maximum 18 fire fighters that can be credited.

Station Location

Station 12 is well located for response. Figure 1 identifies the 2.5 km, 5 km and 8 km coverage areas for Station 12. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.



Fire calls

The historical calls for Station 12 cover a large area of the HRM. Figure 3 shows the response of Station 12 based on its historical calls for the years 2010 to 2013. Station 12 responded to an average of 627 calls in the 45 months reviewed. Table 5 is a breakdown of the calls from 2010 to September 2013. The total for 2013 reflects the emergency calls for the first 9 months of the year. Table 6 shows the breakdown of emergency calls by incident type. The year average was calculated for all calls over the 45 months.

Table 5 Total Emergency calls per year.

Total Calls per Year 2010 - 2013	
Year	No. of Calls
2010	592
2011	677
2012	670
2013	413

Table 6 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	362	97	15.4
False alarm	778	207	33.1
Smoke	439	117	18.7
Motor Vehicle Accident	337	90	14.3
Oil or Gas spill	53	14	2.3
Other	89	24	3.8
Rescue	5	1.3	0.2
Medical Assist	91	24	3.9
Coding	198	53	8.3



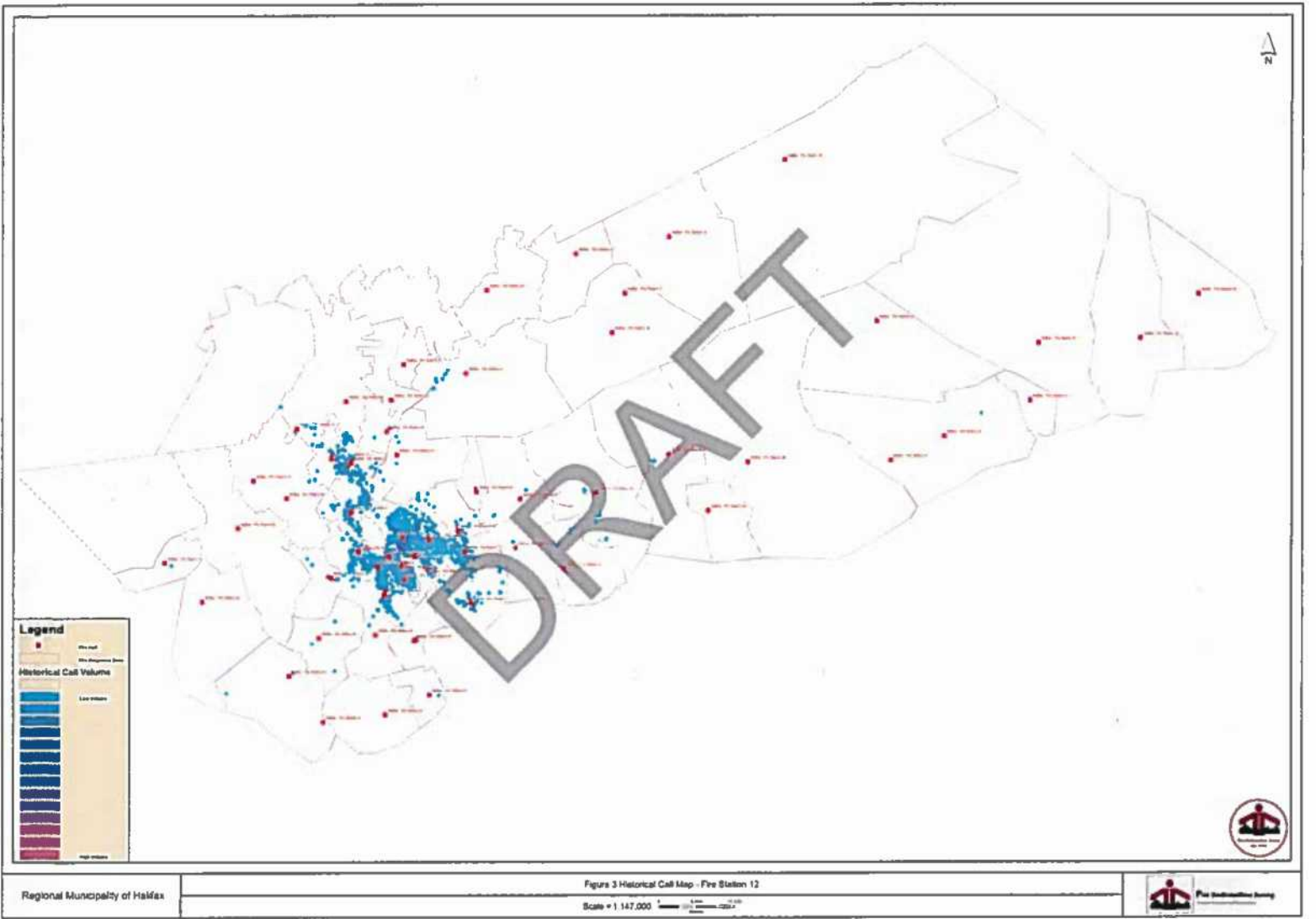
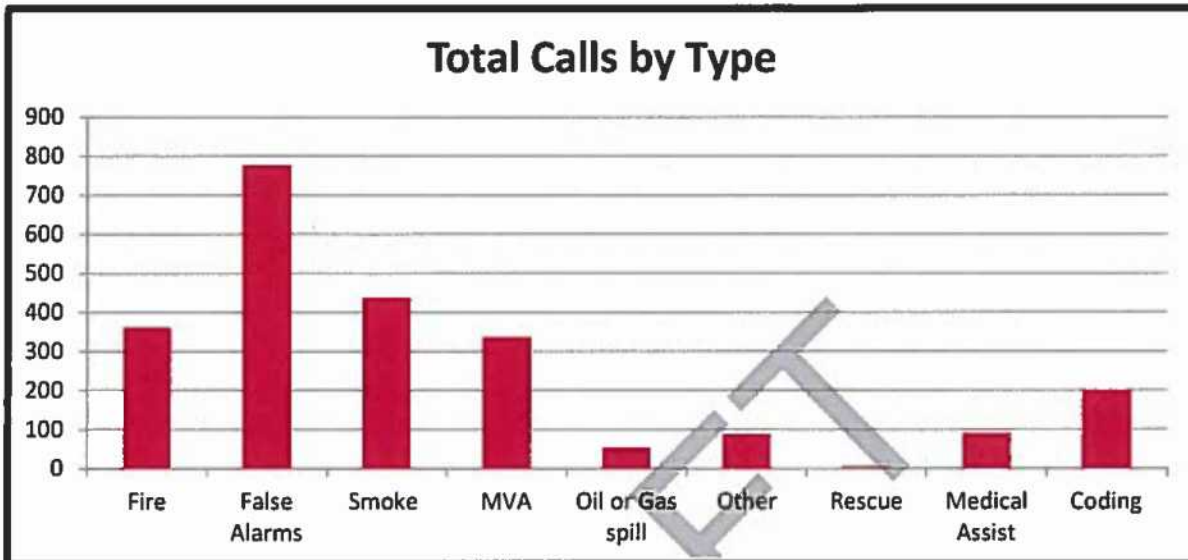


Figure 4 Emergency Calls by Incident Type (2010-2013)



The largest percentage of calls to Station 12 was False Alarm (detectors) fire calls. Currently there is a fine applied to false alarms but it was found to be minimal. The resulting cost of time, apparatus and personnel responding to a fire alarm should be considered when determining applicable fines. The fines should be increased so as to deter false alarms and encourage building owners to maintain and repair fire alarm systems rather than pay a fine for a false alarm. For motor vehicle accidents, the fire department should submit their invoice for services provided as a result of an accident involving a motor vehicle or for a loss to a motor vehicle (i.e. fire) to the Province.

In reviewing the emergency call data it was noted that improvements need to be made in the call reporting procedure. HRM should implement a standard around the time stamping of fire calls and review each month for conformance with the standard and conformance with the "Service Delivery Standards for Halifax Regional Fire and Emergency" for all portions of the call listed in the service delivery standard.



Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Within the HRM Relative Classifications for Emergency Communications, Fire Prevention and Safety Control were determined and applied as a single grade across the entire city.

Relative Classifications for Fire Department and Water Supplies were calculated specifically for individual areas as follows:

- Relative Classification for each Fire District i.e. the primary geographic response zone for each fire station (52 stations in 2013).
- Relative Classification for each Major Pressure Zone (SCADA zone) (17 zones in 2013).

The Fire Department Assessment contributes 40 percent to the total Public Fire Protection Classification grade. This is the most heavily weighted portion of the grading and as such is considered to be the most significant indicator of a community or municipality's overall preparedness for dealing with fire emergencies.

[REDACTED] This forms the basis of the relative classification of the Fire Department.



Figure 5 Fire Department Item Weights

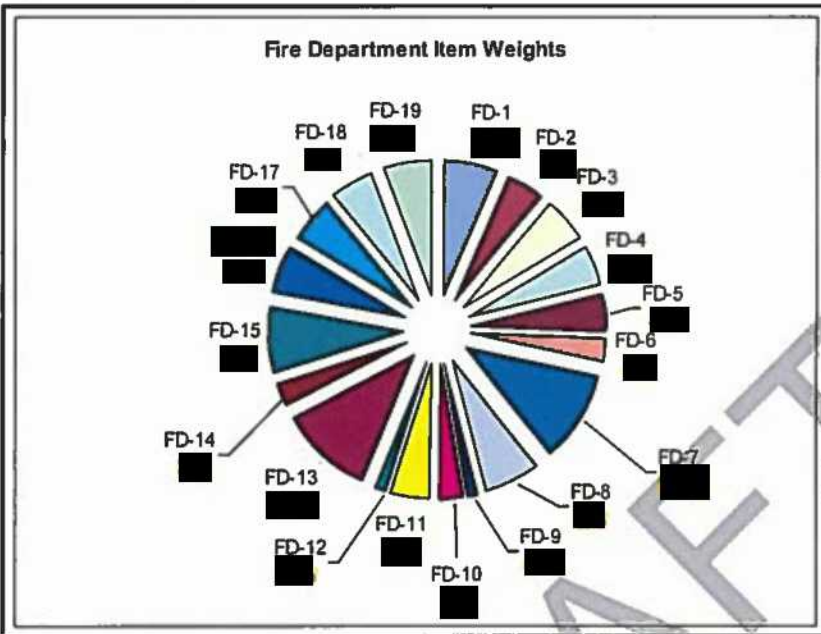


Figure 6 Fire Department Credit Points

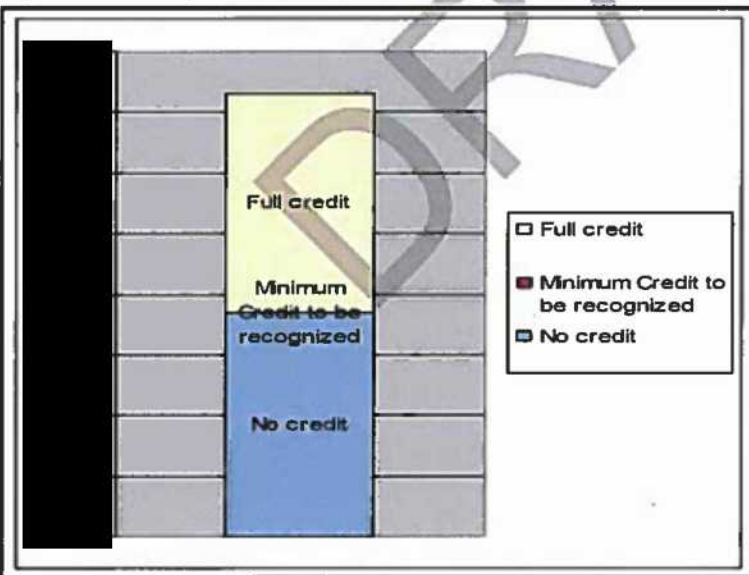
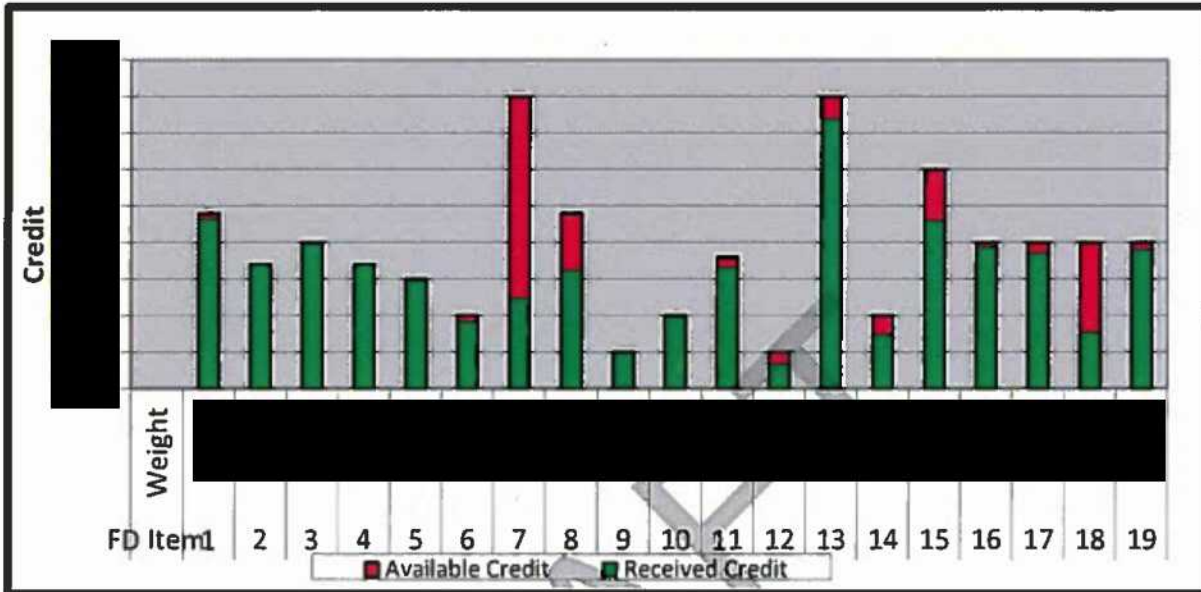


Table 7 Fire Department Grading Items Overall Summary

Grading Item	Category	Credit Received	Maximum Credit	% of FD	% of All
FD-1	Engine Service	232			
FD-2	Ladder Truck Service	170			
FD-3	Distribution of Companies and Type of Apparatus	200			
FD-4	Engine and Ladder Pump Capacity	170			
FD-5	Design, Maintenance and Condition of Apparatus	148			
FD-6	Number of Line Officers – Fire Suppression	92			
FD-7	Total Fire Force Available	124			
FD-8	Engine and Ladder Company Unit Manning	162			
FD-9	Master and Special Stream Devices	50			
FD-10	Equipment for Engines and Ladder Trucks, General	98			
FD-11	Fire Hose	166			
FD-12	Condition of Fire Hose	33			
FD-13	Training and Qualifications	369			
FD-14	Response to Alarms	74			
FD-15	Fire Ground Operations	230			
FD-16	Special Protection Required	194			
FD-17	Miscellaneous Factors and Conditions	185			
FD-18	Pre-Incident Planning	77			
FD-19	Administration	190			
Weight in Grading	40			Credit Received	24.74
Relative Classification					
4					



Figure 7 Fire Department Grading Items Overall Summary



Fire Station 12 was assigned a Relative Class of 4. The figure above shows each grading item of the fire department and how much credit was received and how much credit is still available within each grading item. The relative classification contributes to the overall Public Fire Protection Classification (PFPC) of Fire District 12 and that of the entire Halifax Regional Municipality. Factoring in the Water Supply, Fire Safety Control and Emergency Communication grading items, Fire Station 12 was assigned an overall Public Fire Protection Classification of 4. This indicates that the level of response is proportionate to the level of risk in the fire protection district.

To maintain the firefighting capabilities and the credit received for fire insurance grading purposes, it is recommended that the six career fire fighters be maintained at Station 12 and the four person crew from Station 13 be assigned to Station 12 for a total of 10 career fire fighters. The closing of Station 13 will increase Station 12's overall first response coverage area and consequently increase the call volume to the station. However this is well within the capacity of Station 12 when considering proposed improvements to the staffing and apparatus at this station.

Maintaining the Public Fire Protection Classification for Station 12 will ensure residents within the fire protection area receive the full benefit of available property insurance premium discounts based on the



level of fire protection provided. In the event the Station 12 is downgraded from a PFPC 4 to PFPC 5 the resulting cost to the tax payer in the form of insurance premiums is approximately \$11,000,000.00 in insurance premium increases for the zone. These values are estimates only as insurance rates are dynamic and dependent on a large number of factors. A further point to consider is that as the PFPC decreases in value, i.e. going from PFPC 5 to PFPC 4 the capacity of an insurer to underwrite in the City can change and in turn can create competition which can lower rates. It is difficult to quantify the true effects and figures given here are estimates.

Table 8 Premium Estimates under the Public Fire Protection Classification System – Response Zone 12

Public Fire Protection Classification	Total Premium Estimates Prior to FUS Study	Total Premium Estimates Post FUS Study	Total Premium Estimates Difference
3	\$18,116,441		
4		\$19,565,756	\$1,449,315
5		\$29,892,128	\$11,775,686

Recommendations

- Relocate Station 13 crew to Station 12.
- Relocate the Quint from Station 12 to another station requiring a Quint.
- Assign a Ladder and Engine in service at Station 12 for a total fleet of 10 personnel, an Aerial apparatus, an Engine and a Tactical unit.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 13

86 King Street

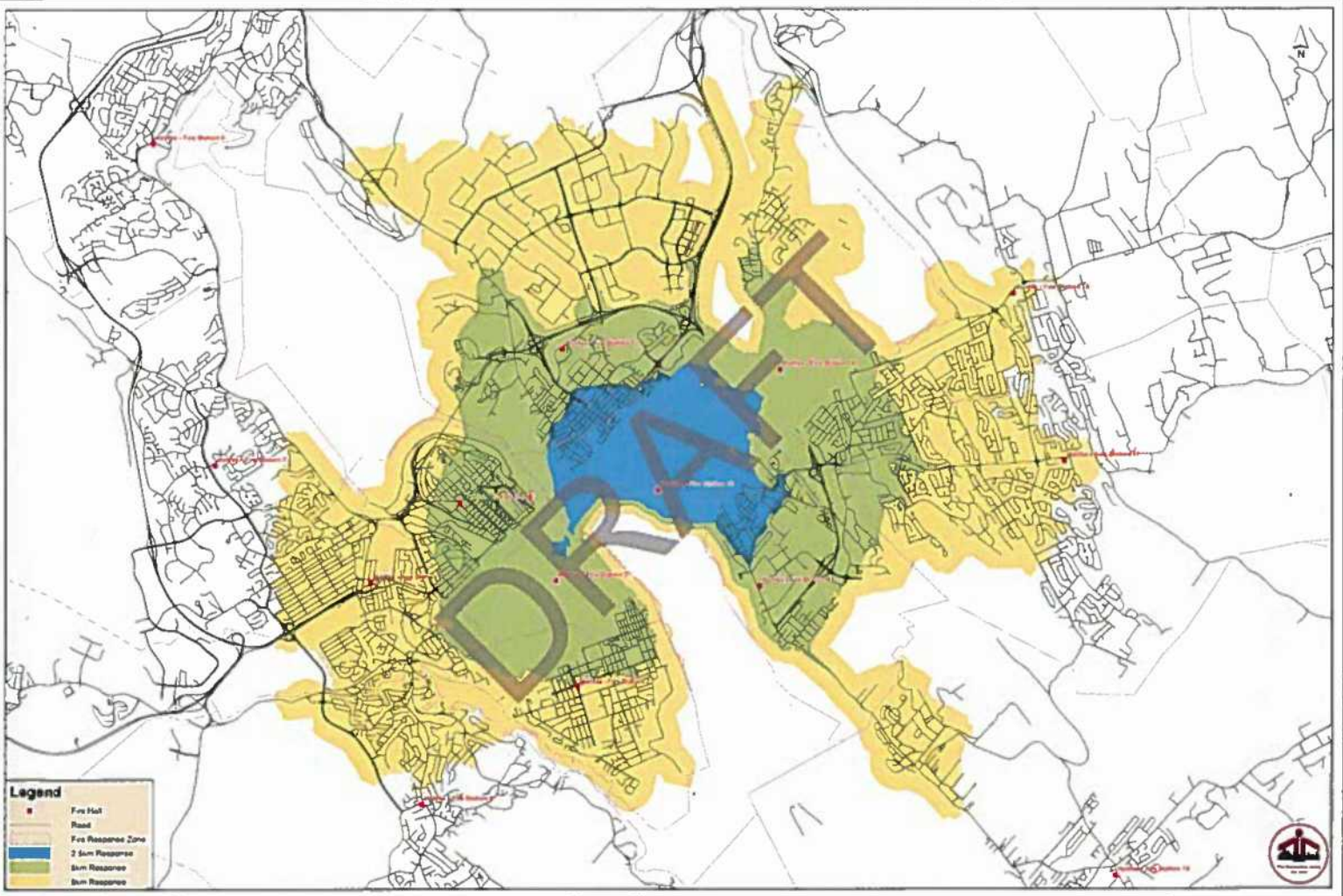


Station 13 is located at 86 King Street in Dartmouth and is bordered by King Street to the west and Wentworth Street to the east. The station exits onto King Street and is located in a fairly central position for response to its overall coverage area. Figure 1 shows the 2.5 km, 5 km and 8 km coverage from Station 13.

Building and Tarmac

All fire stations should be of substantial construction, suitable for the service, and located and arranged for ease and quickness of response. Fire Station 13 is constructed of masonry and steel, with brick cladding and was originally constructed in 1949. The roof construction is a modified bitumen membrane. The tarmac is a concrete covered area which extends from the bay door to the street. The tarmac area is not sufficient for vehicle run ups and day routines.





Legend

- Fire Hall
- Road
- Fire Response Zone
- 2 km Response
- 5 km Response
- 10 km Response



Regional Municipality of Halifax

Figure 1.2 5/5/5km Response from Fire Station 13

Scale = 1:10,000



Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. Facilities in the main floor of the building consist of an apparatus bay, mechanical and electrical rooms and equipment maintenance areas. The second floor of the building contains sleeping quarters, a day room and kitchen, fitness area, a captain's office, and training/office areas. The facilities in Station 13 are adequate to meet the needs of the staff.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

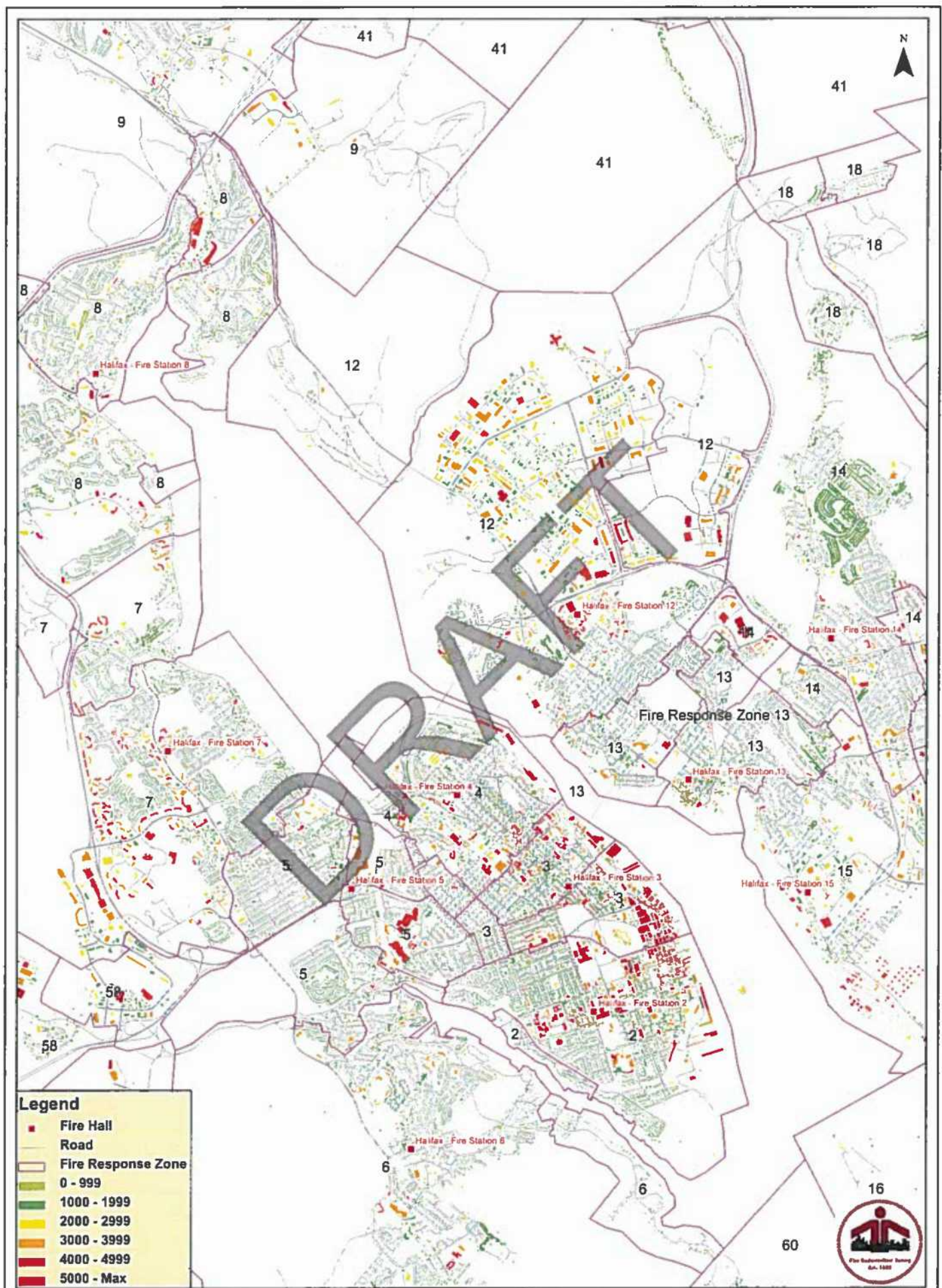
Community Risk Profile – Response Zone 13

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 3,859 Required Fire Flows were calculated for Response Zone 13 as shown in Figure 2 below. Table 1 below depicts the average Required Fire Flows calculated.

Table 1 Required Fire Flow ranges in Response Zone 13

RFF Range	No. of RFF points
0-999 IGPM	1,450
1,000-1,999 IGPM	2,282
2,000-2,999 IGPM	89
3,000-3,999 IGPM	27
4,000-4,999 IGPM	5
>=5,000 IGPM	6





In addition the Basic Fire Flow was determined for the response area. The Basic Fire Flow is usually calculated as the 95th percentile RFF value or the 5th highest in the Fire Response Area. Considerations are given to the exposure risk, quantity of risks, and type of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response Zone 13 is based on the fifth highest which is 5,200 Imperial Gallons per Minute.

Table 2 Basic Fire Flows for HRM Response Zone 13

Total RFF Points	3,859	
	IGPM	L/s
90th Percentile	1,400	106.12
95th Percentile	1,700	128.86
Max	6,900	523.02
5th highest	5,200	394.16

Apparatus & Personnel

Standard staffing for Station 13 is a 4 person 24/7 shift. Apparatus assignment for Station 13 is one Quint.

Station 13 was evaluated for the number of Engine and Ladder companies in service relative to the overall fire potential and the area being protected. Apparatus are required to be adequately housed and staffed. Fire apparatus that serve dual purposes are evaluated based on the primary duty it serves on the fire ground. The Total Credited Engine Companies is calculated [REDACTED]

[REDACTED] The credit may be downgraded from 100 percent based on reliability factors such as age, quality, listing, pump test results and distance.

Based on the Basic Fire Flow of 5,200 IGPM, the apparatus requirements for Fire Station 13 as defined in the Fire Underwriters Survey - Table of Effective Response is as follows:

- First due Pumper Company in 2.5 minutes.
- Second due Pumper Company in 4 minutes.



- First due Ladder Company in 3.5 minutes.

The benchmark number of apparatus required is 7 Pumper companies in 7.5 minutes and 2 Ladder companies in 5 minutes. These requirements reflect the apparatus need to attain maximum credit in the Engine and Ladder items of the fire department grading and serve as a benchmark against which response is measured. Ladders received 50 percent credit as Engine apparatus and 100 percent credit as Ladder apparatus. Fire Station 13 received credit for 5.5 Engines out of the maximum 7 Engine companies that can be credited for grading.

Table 3 Credited in Service Engine Summary

Station #	Vehicle Type	Apparatus Credit	Engine Credit	Reserve Engine Credit
13	Quint	50% Engine Credit	0.5	0
15	Engine	100% Engine Credit	1	0
3	Ladder	50% Engine Credit	0.5	0
3	Engine	100% Engine Credit	1	0
12	Quint	50% Engine Credit	0.5	0
14	Engine	100% Engine Credit	1	0
4	Engine	100% Engine Credit	1	0
	Engine	100% Reserve Credit	0	1
Total Engine Credit:			5.5	0
Maximum Credit Receivable (5,200 lpgm):			7	1

Response areas with five buildings that are 3 storeys or 10 m (35 ft.) or more in height, or districts that have a Basic Fire Flow greater than 3,300 IGPM, or any combination of these criteria, should have a Ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed Ladder companies for fire insurance grading to receive maximum credit. There are multiple buildings within the HRM Response Zone 13 that are three storeys or more in height. In addition several of the calculated Required Fire Flows were greater than 3,300 IGPM. Currently there is one Quint stationed at Station 13. Fire Station 13 received Primary Ladder Credit for one Ladder and Support Ladder Credit for two ladders that would respond from Station 3 and 12. The credit received for Support Ladders was downgraded based on the distance



from the responding hall. Station 13 received credit for 3 Ladders out of the maximum 2 Ladder companies that can be credited for grading.

Table 4 Credited in Service Ladder Summary

Station #	Vehicle Type	Apparatus Credit	Ladder Credit	Reserve Ladder Credit
3	Ladder	100% Ladder Credit	1	0
13	Quint	100% Ladder Credit	1	0
12	Quint	100% Ladder Credit	1	0
	Ladder	100% Reserve Credit	0	1
Total Ladder/Reserve Ladder Credit:			3	1
Maximum Credit Receivable (5,200 Igpm):			2	1

Staffing at Station 13 was evaluated in its ability to meet the staffing requirements as determined by the Basic Fire Flow benchmark from the Table of Effective Response. The staffing was measured against the FUS benchmark of at least six competent career fire fighters available and assigned to respond to fire for duty with each required Engine and Ladder Company. The number of first due (initial response) engine companies and ladder companies based on the benchmark Basic Fire Flow of 5,200 IGPM is two Engine companies and one Ladder company. The maximum credit that Station 13 can receive for total available fire force response for a Basic Fire Flow of 5,200 IGPM is 18 fire fighters. Fire Station 13 was credited with four fire fighter equivalent units in its initial available fire force out of the maximum 18. NFPA 1710 requires each fire apparatus to be staffed with a minimum of four personnel.

Station Location

Figure 1 identifies the 2.5 km, 5 km and 8 km coverage areas for Station 13. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.



Fire calls

The historical calls for Station 13 cover a large area of the HRM. Figure 3 shows the response of Station 13 based on its historical calls for the years 2010 to 2013. Station 13 responded to an average of 418 calls per year in in the 45 months reviewed. Table 5 is a breakdown of the calls from 2010 to September 2013. The total for 2013 reflects the emergency calls for the first 9 months of the year. Table 6 shows the breakdown of emergency calls by incident type. The year average was calculated for all calls over the 45 months.

Table 5 Total Emergency calls per year.

Total Calls per Year 2010 - 2013	
Year	No. of Calls
2010	464
2011	440
2012	433
2013	230

Table 6 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	225	60	14.4
False alarm	410	109	26.2
Smoke	322	86	20.5
Motor Vehicle Accident	239	64	15.3
Oil or Gas spill	17	4.5	1.1
Other	66	18	4.2
Rescue	6	1.6	0.4
Medical Assist	121	32	7.7
Coding	161	43	10.2



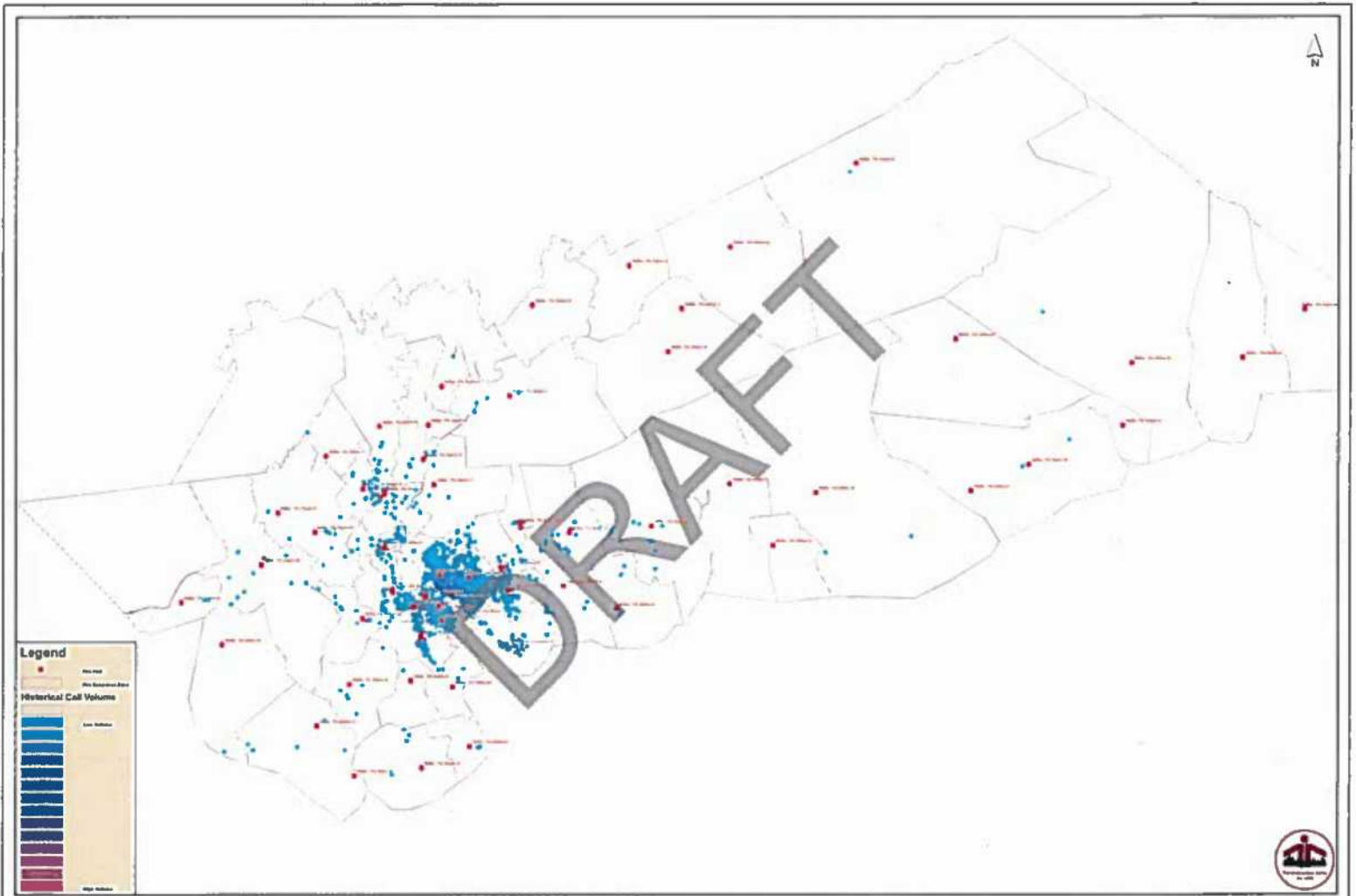
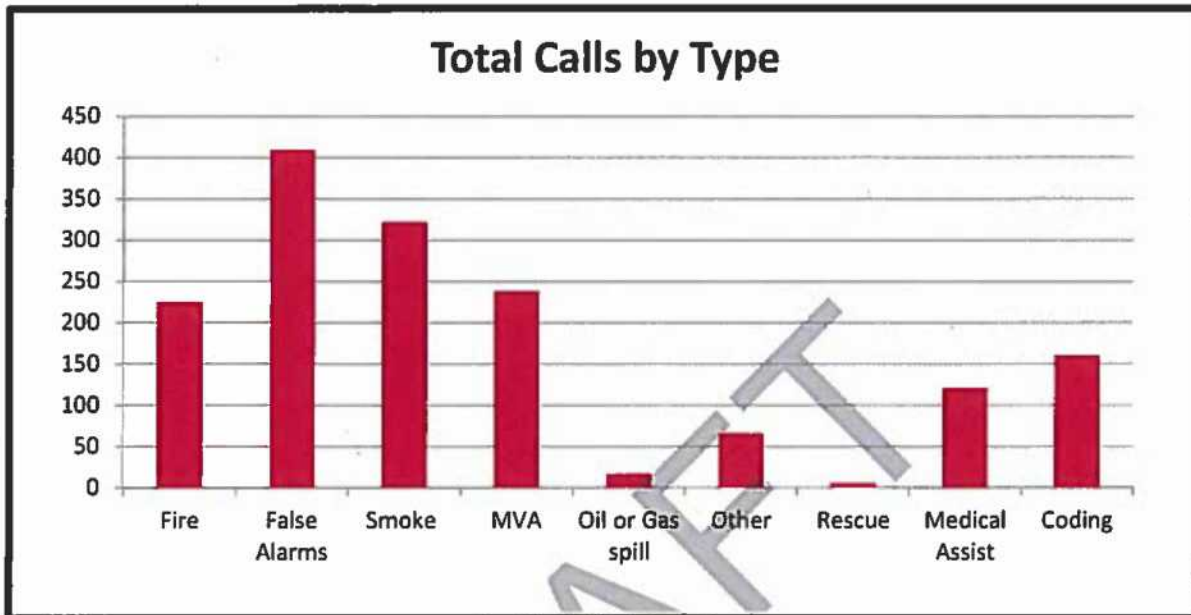


Figure 3 Historical Call Map - Fire Station 13

Figure 4 Emergency Calls by Incident Type (2010-2013)



The largest percentages of calls to Station 13 were False Alarm (detectors) fire calls and motor vehicle accidents (MVA). Currently there is a fine applied to false alarms but it was found to be minimal. The resulting cost of time, apparatus and personnel responding to a fire alarm should be considered when determining applicable fines. The fines should be increased so as to deter false alarms and encourage building owners to maintain and repair fire alarm systems rather than pay a fine for a false alarm. There were several motor vehicle accident calls. Motor Vehicle Accidents have a fund in Nova Scotia created by the provincial government and calls should be billed out by the City to the province. Fire departments can submit their invoice for services provided as a result of an accident involving a motor vehicle or for a loss to a motor vehicle (i.e. fire) to the Province.

In reviewing the emergency call data it was noted that improvements need to be made in the call reporting procedure. HRM should implement a standard around the time stamping of fire calls and review each month for conformance with the standard and conformance with the "Service Delivery Standards for Halifax Regional Fire and Emergency" for all portions of the call listed in the service delivery standard.

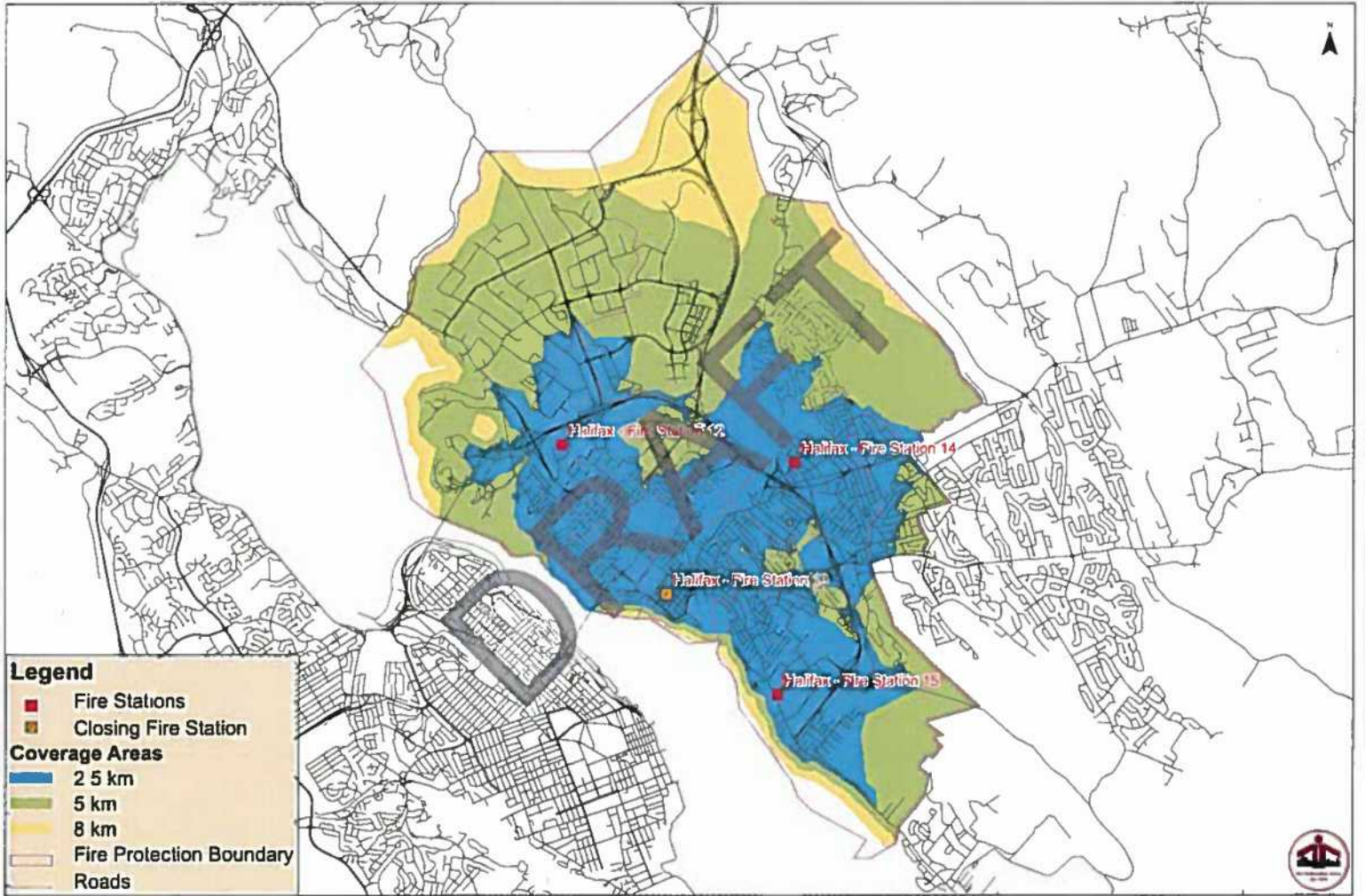


Station 13 Closure Analysis

An analysis was carried out to examine the impact on coverage should Station 13 be closed. This was done by analysing how many risks (Required Fire Flow points) would be left uncovered following the closure of the fire hall. Figure 5 and 6 below show the effect of closing Fire Station 13. Currently there are approximately 15,953 risks within Fire Station 13's 8km response zone which accounts for 99.9% of risks in the response zone. Approximately 15,924 risks are within the station's 5km response which is 99.7% of risks in the response zone. With the closure of Station 13, all of these risks will remain covered under 5km and 8km response from another station. A small number of commercial and higher risks in Dartmouth would be affected by loss of coverage under 2.5km. However the 2.5km coverage pertains strictly to fire insurance grading and does not impact the evaluation of response against National Fire Protection Association guidelines. Figure 5 shows the areas covered by Station 13 prior to closing the station and Figure 6 shows the areas affected after closing Station 13. The results of the analysis show that closing Station 13 will not have a significant impact on response in the area. Station 13 should be closed.

DRAFT

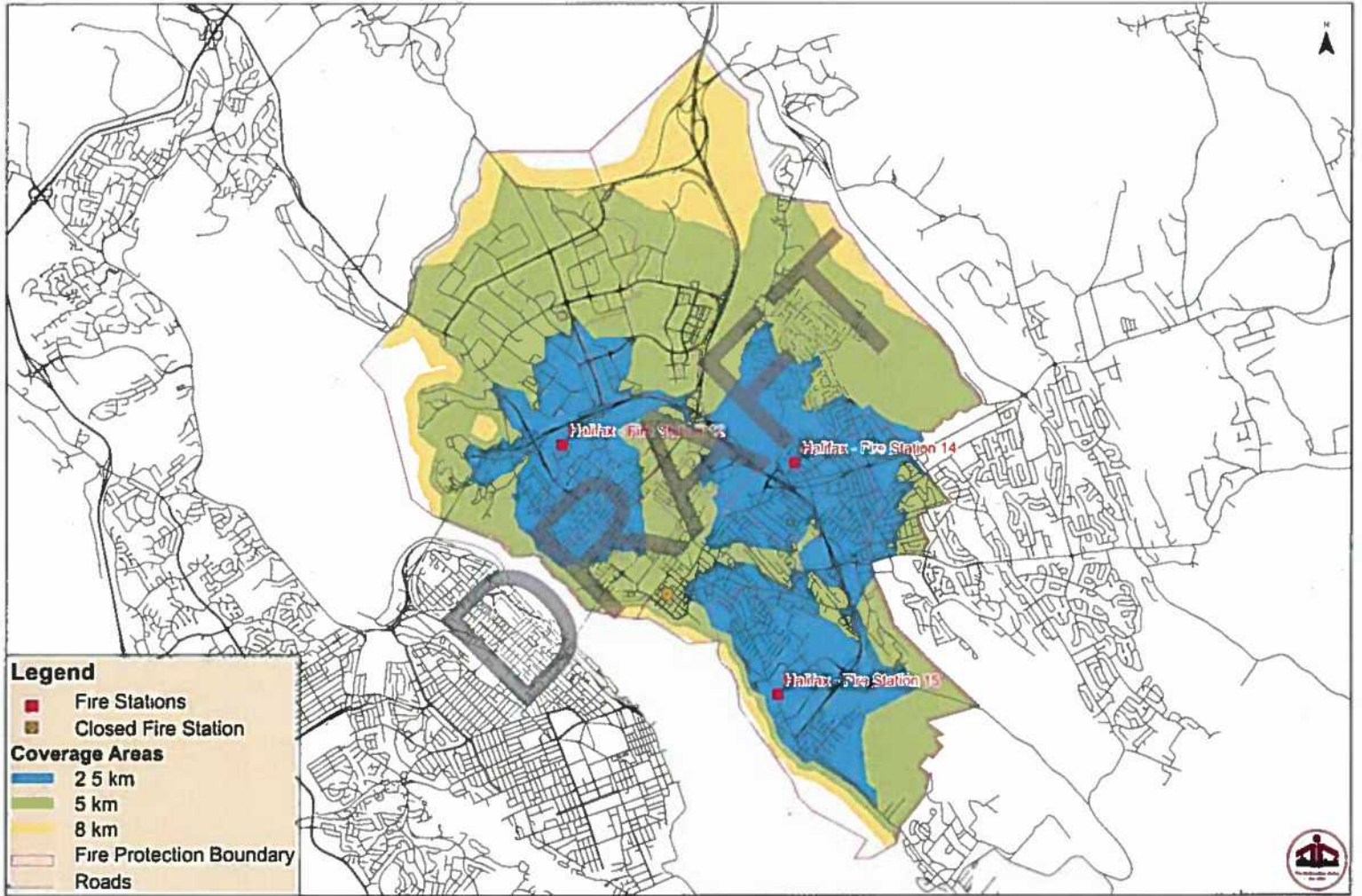




- Legend**
- Fire Stations
 - Closing Fire Station
 - Coverage Areas**
 - 2.5 km
 - 5 km
 - 8 km
 - Fire Protection Boundary
 - Roads

Halifax





Halifax



Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Within the HRM Relative Classifications for Emergency Communications, Fire Prevention and Safety Control were determined and applied as a single grade across the entire city.

Relative Classifications for Fire Department and Water Supplies were calculated specifically for individual areas as follows:

- Relative Classification for each Fire District i.e. the primary geographic response zone for each fire station (52 stations in 2013).
- Relative Classification for each Major Pressure Zone (SCADA zone) (3 distribution areas in 2013).

The Fire Department Assessment contributes 40 percent to the total Public Fire Protection Classification grade. This is the most heavily weighted portion of the grading and as such is considered to be the most significant indicator of a community or municipality's overall preparedness for dealing with fire emergencies.

[REDACTED] This forms the basis of the relative classification of the Fire Department.



Figure 7 Fire Department Item Weights

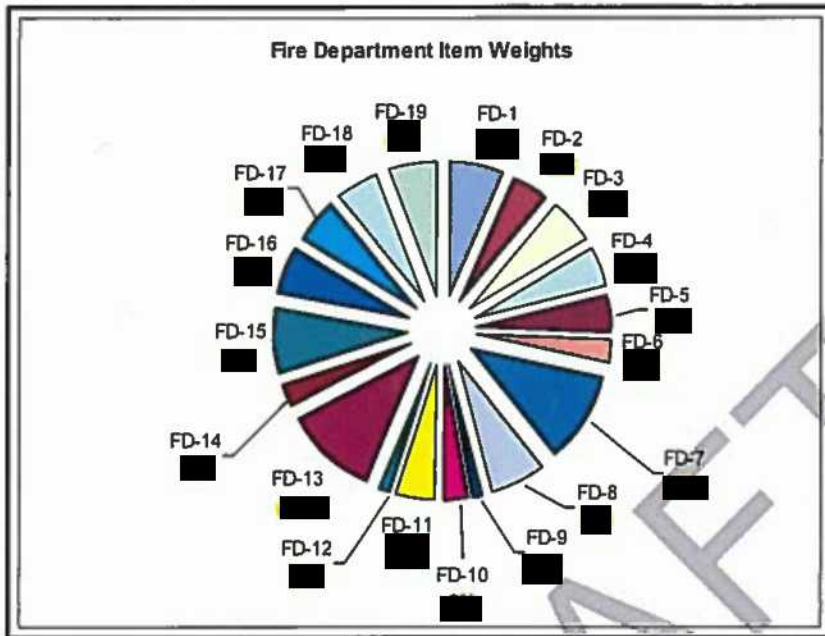


Figure 8 Fire Department Credit Points

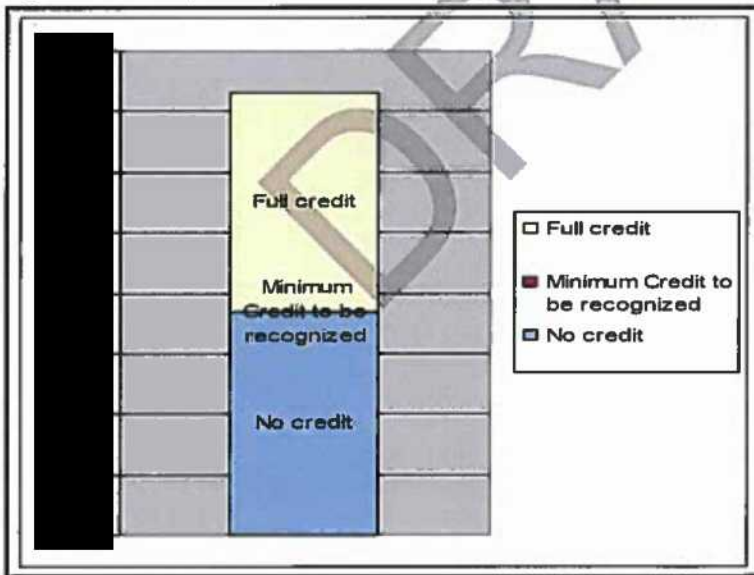
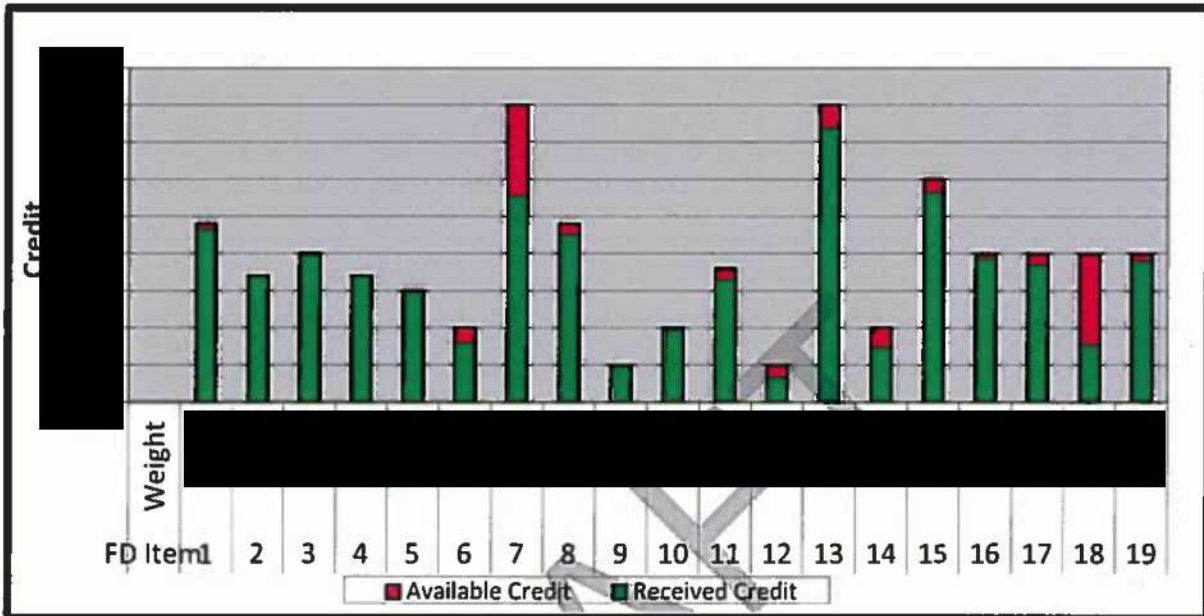


Table 7 Fire Department Grading Items Overall Summary

Grading Item	Category	Credit Received	Maximum Credit	% of FD	% of All
FD-1	Engine Service	232			
FD-2	Ladder Truck Service	170			
FD-3	Distribution of Companies and Type of Apparatus	200			
FD-4	Engine and Ladder Pump Capacity	170			
FD-5	Design, Maintenance and Condition of Apparatus	148			
FD-6	Number of Line Officers – Fire Suppression	80			
FD-7	Total Fire Force Available	278			
FD-8	Engine and Ladder Company Unit Manning	225			
FD-9	Master and Special Stream Devices	50			
FD-10	Equipment for Engines and Ladder Trucks, General	98			
FD-11	Fire Hose	165			
FD-12	Condition of Fire Hose	33			
FD-13	Training and Qualifications	369			
FD-14	Response to Alarms	74			
FD-15	Fire Ground Operations	283			
FD-16	Special Protection Required	194			
FD-17	Miscellaneous Factors and Conditions	185			
FD-18	Pre-Incident Planning	77			
FD-19	Administration	190			
Weight in Grading					
	40			Credit Received	30.44
Relative Classification					
3					



Figure 9 Fire Department Grading Items Overall Summary



Fire Station 13 was assigned a Relative Class of 3. The figure above shows each grading item of the fire department and how much credit was received and how much credit is still available within each grading item. The relative classification contributes to the overall Public Fire Protection Classification (PFPC) of Fire District 13 and that of the entire Halifax Regional Municipality. Factoring in the Water Supply, Fire Safety Control and Emergency Communication grading items, Fire Station 13 was assigned an overall Public Fire Protection Classification of 4.

Recommendations

- Close Station 13 and transfer staff to Station 12.
- Relocate apparatus to address apparatus needs in other areas of the HRM.



STATION 14
1 Second Street



Station 14 is located at 1 Second Street in Dartmouth and is bordered by Walker Street to the north east, Second Street to the south east and Dartmouth School of Music to the west. The station is located in a fairly central position for response to its overall coverage area. Figure 1 shows the 2.5 km, 5 km and 8 km coverage from Station 14.

Building and Tarmac

All fire stations should be of substantial construction, suitable for the service, and located and arranged for ease and quickness of response. Fire Station 14 is a single story concrete and steel building with a brick veneer exterior cladding. The tarmac is an asphalt covered area which extends from the bay door to the street. The tarmac area is sufficient for vehicle run ups and day routines.



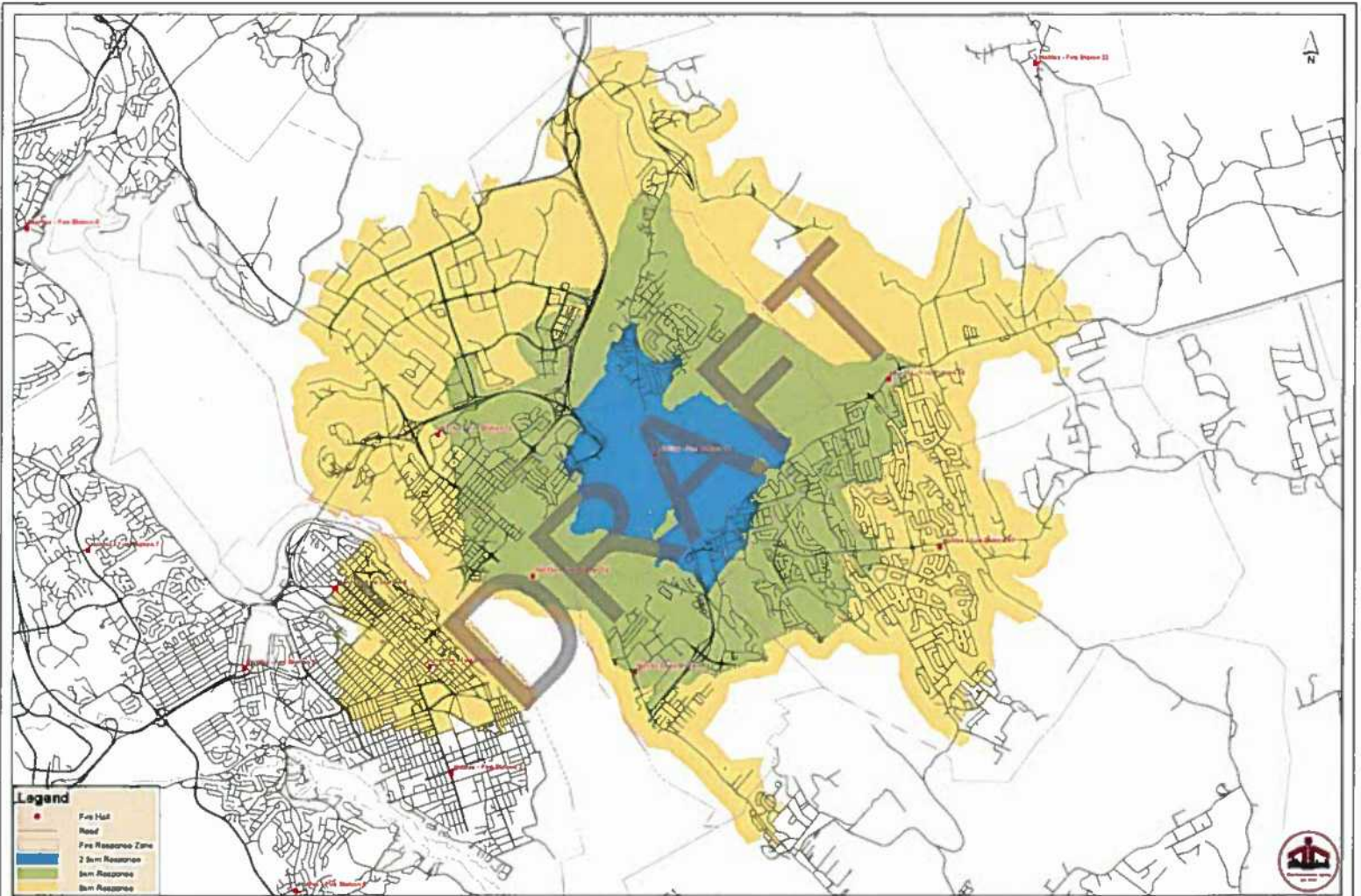


Figure 1.2.5/5km Response from Fire Station 14

Scale = 1:18,000

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. A kitchen area, sleeping quarters, a day room and a captain's office are located in the building. Apparatus bays are located in the same building. The facilities at this station are adequate to meet the needs of the staff.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

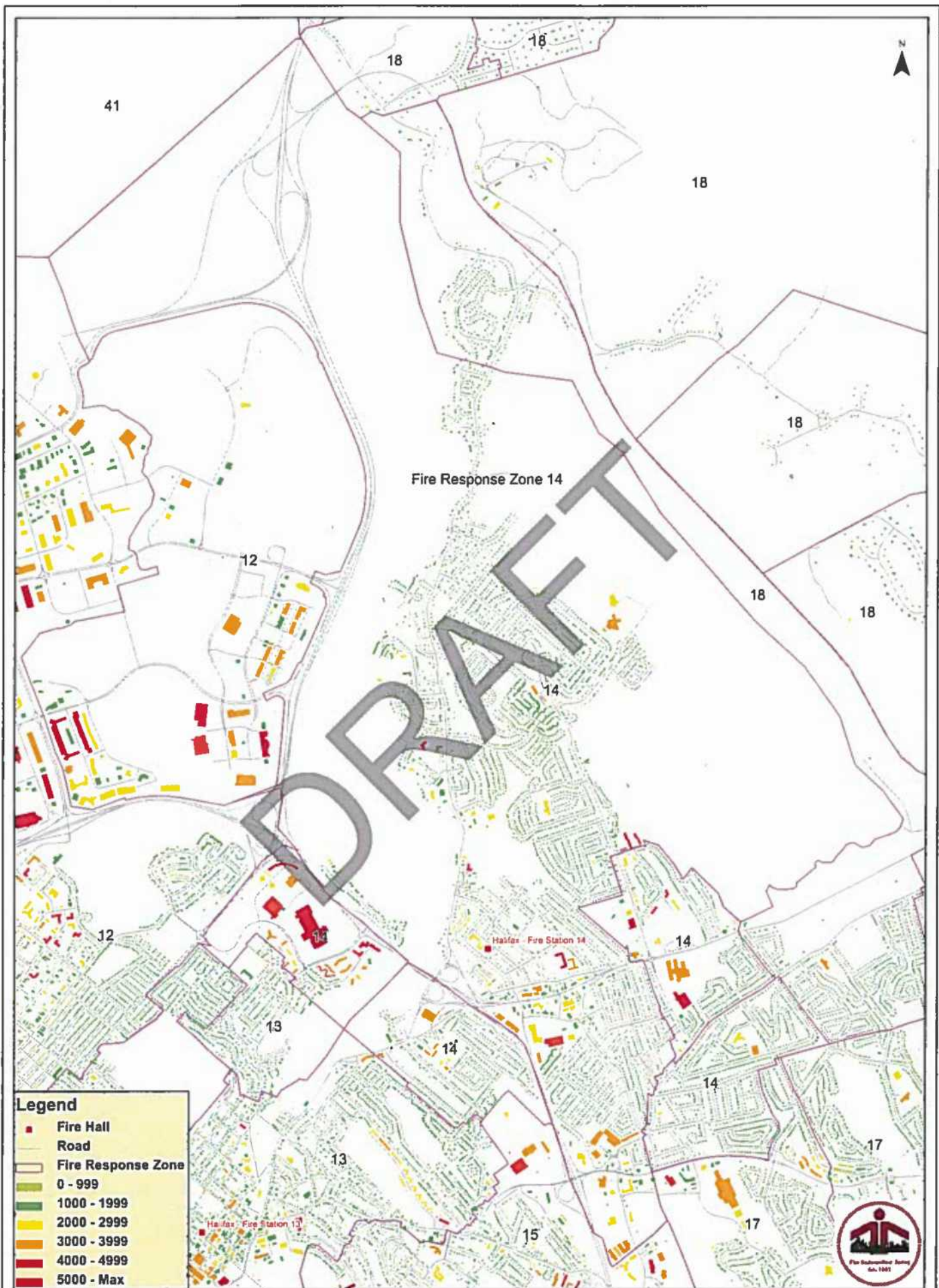
Community Risk Profile – Response Zone 14

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 6,244 Required Fire Flows were calculated for Response Zone 14 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 14

RFF Range	No. of RFF points
0-999 IGPM	941
1,000-1,999 IGPM	5,168
2,000-2,999 IGPM	83
3,000-3,999 IGPM	35
4,000-4,999 IGPM	9
>=5,000 IGPM	8





In addition the Basic Fire Flow was determined for the response area. The Basic Fire Flow is usually calculated as the 95th percentile RFF value or the 5th highest in the Fire Response Area. Considerations are given to the exposure risk, quantity of risks, and type of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response Zone 14 is based on the 95th percentile which is 1,500 Imperial Gallons per Minute.

Table 2 Basic Fire Flows for HRM Response Zone 14

Total RFF Points	6,244	
	IGPM	L/s
90th Percentile	1,400	106.12
95th Percentile	1,500	113.70
Max	8,100	613.98
5th highest	5,400	409.32

Apparatus & Personnel

Standard staffing for Station 14 is a 4 person 24/7 shift. Apparatus assignment for Station 14 is one Engine.

Station 14 was evaluated for the number of Engine and Ladder companies in service relative to the overall fire potential and the area being protected. Apparatus are required to be adequately housed and staffed. Fire apparatus that serve dual purposes are evaluated based on the primary duty it serves on the fire ground. The Total Credited Engine Companies is calculated [REDACTED]

[REDACTED] The credit may be downgraded from 100 percent based on reliability factors such as age, quality, listing, pump test results and distance.

Based on the Basic Fire Flow of 1,500 IGPM, the apparatus requirements for Fire Station 14 as defined in the Fire Underwriters Survey - Table of Effective Response is as follows:

- First due Pumper Company in 3.5 minutes.
- Second due Pumper Company in 5 minutes.



- First due Ladder Company in 4 minutes (if required by hazards).

The benchmark number of apparatus required is 2 Pumper companies in 5 minutes and 1 Ladder companies in 4 minutes (if required by hazards). These requirements reflect the apparatus need to attain maximum credit in the Engine and Ladder items of the fire department grading and serve as a benchmark against which response is measured. Ladders received 50 percent credit as Engine apparatus and 100 percent credit as Ladder apparatus. Fire Station 14 received credit for 2.4 Engines out of the maximum 2 Engine companies that can be credited for grading.

Table 3 Credited in Service Engine Summary

Station #	Vehicle Type	Apparatus Credit	Engine Credit	Reserve Engine Credit
14	Engine	100% Engine Credit	1	0
13	Quint	44% Engine Credit	0.44	0
18	Engine	100% Engine Credit	1	0
	Engine	100% Reserve Credit	0	1
Total Engine Credit:			2.44	1
Maximum Credit Receivable (1,500 Igpm):			2	1

Response areas with five buildings that are 3 storeys or 10 m (35 ft.) or more in height, or districts that have a Basic Fire Flow greater than 3,300 IGPM, or any combination of these criteria, should have a Ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed Ladder companies for fire insurance grading to receive maximum credit. There are multiple buildings within the HRM Response Zone 14 that are three storeys or more in height. In addition several of the calculated Required Fire Flows were greater than 3,300 IGPM. Currently there is no ladder stationed at Station 14. Station 14 received Support Ladder credit for one Quint responding from Station 13. The credit received for Support Ladders was downgraded based on the distance from the responding hall. As shown in Table 4 below, the credit received for fire insurance grading is 0.87 Ladder companies out of a maximum 1 Ladder companies.



Table 4 Credited in Service Ladder Summary

Station #	Vehicle Type	Apparatus Credit	Ladder Credit	Reserve Ladder Credit
13	Quint	87% Ladder Credit	0.87	0
	Ladder	100% Reserve Credit	0	1
Total Ladder/Reserve Ladder Credit:			0.87	1
Maximum Credit Receivable (1,500 Igpm):			1	1

Staffing at Station 14 was evaluated in its ability to meet the staffing requirements as determined by the Basic Fire Flow benchmark from the Table of Effective Response. The total available fire force grading item is weighted heavily within the fire insurance grading of the fire department. The staffing was measured against the FUS benchmark of at least six competent career fire fighters available and assigned to respond to fire for duty with each required Engine and Ladder Company. The number of first due (initial response) engine companies and ladder companies based on the benchmark Basic Fire Flow of 1,500 IGPM is two Engine companies. The maximum credit that Station 14 can receive for initial available fire force response for two engine companies is 12 fire fighters. NFPA 1710 requires each fire apparatus to be staffed with a minimum of four personnel. The current initial response from Station 14 is one Engine staffed with four fire fighters. The station was therefore credited with four fire fighters available for initial response out of the maximum 12 fire fighters that can be credited for initial response.

Station Location

Station 14 is well located for response. Figure 1 identifies the 2.5 km, 5 km and 8 km coverage areas for Station 14. The blue area is the 2/5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.



Fire calls

Figure 3 shows the response of Station 14 based on its historical calls for the years 2010 to 2013. Station 14 responded to an average of 407 calls per year in the 45 months reviewed. Table 5 is a breakdown of the calls from 2010 to September 2013. The total for 2013 reflects the emergency calls for the first 9 months of the year. Table 6 shows the breakdown of emergency calls by incident type. The year average was calculated for all calls over the 45 months.

Table 5 Total Emergency calls per year.

Total Calls per Year 2010 - 2013	
Year	No. of Calls
2010	387
2011	391
2012	459
2013	289

Table 6 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	220	59	14.4
False alarm	423	113	27.7
Smoke	268	71	17.6
Motor Vehicle Accident	249	66	16.3
Oil or Gas spill	11	3	0.7
Other	54	14	3.5
Rescue	4	1.1	0.3
Medical Assist	98	26	6.4
Coding	199	53	13.1



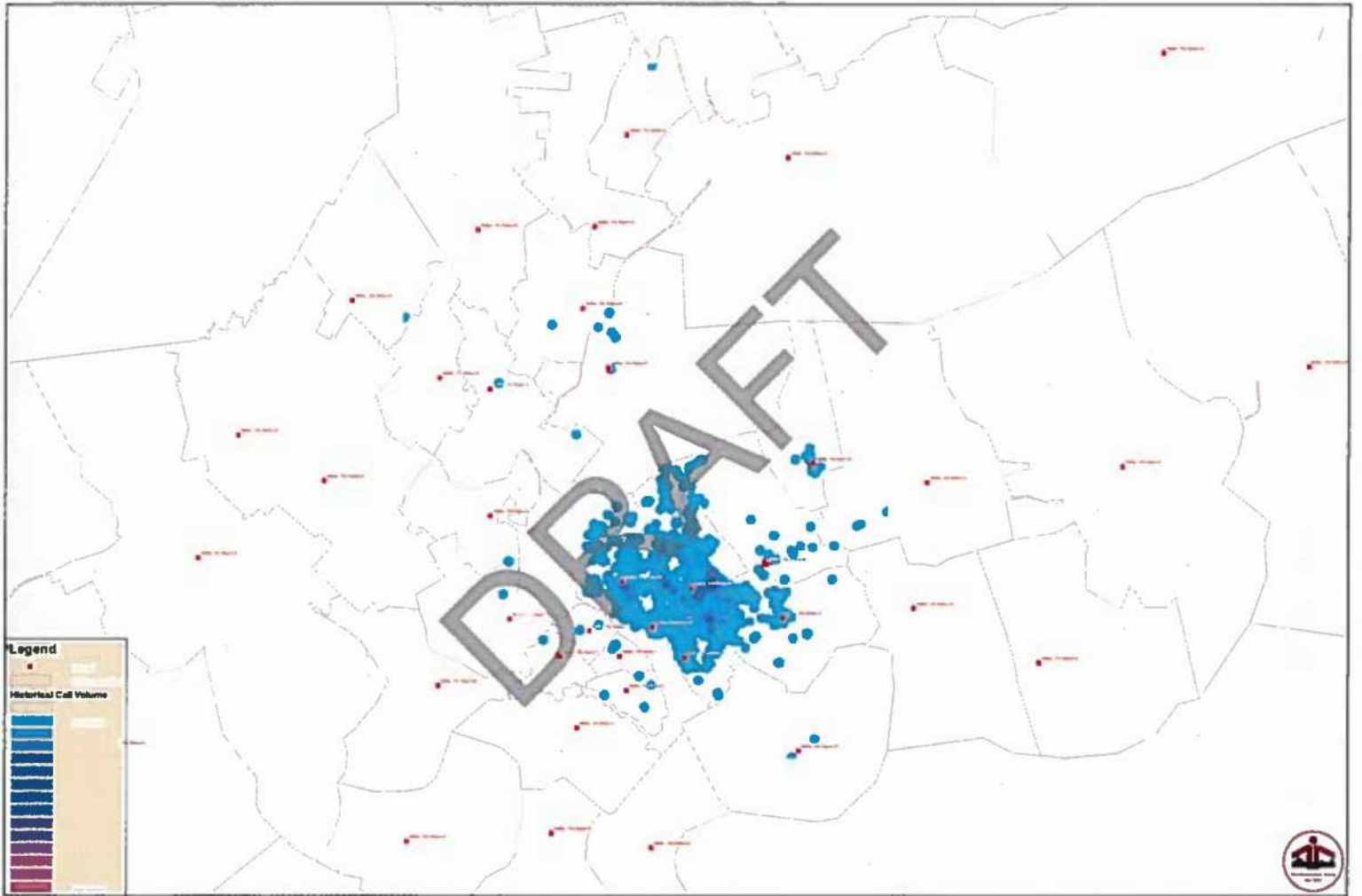
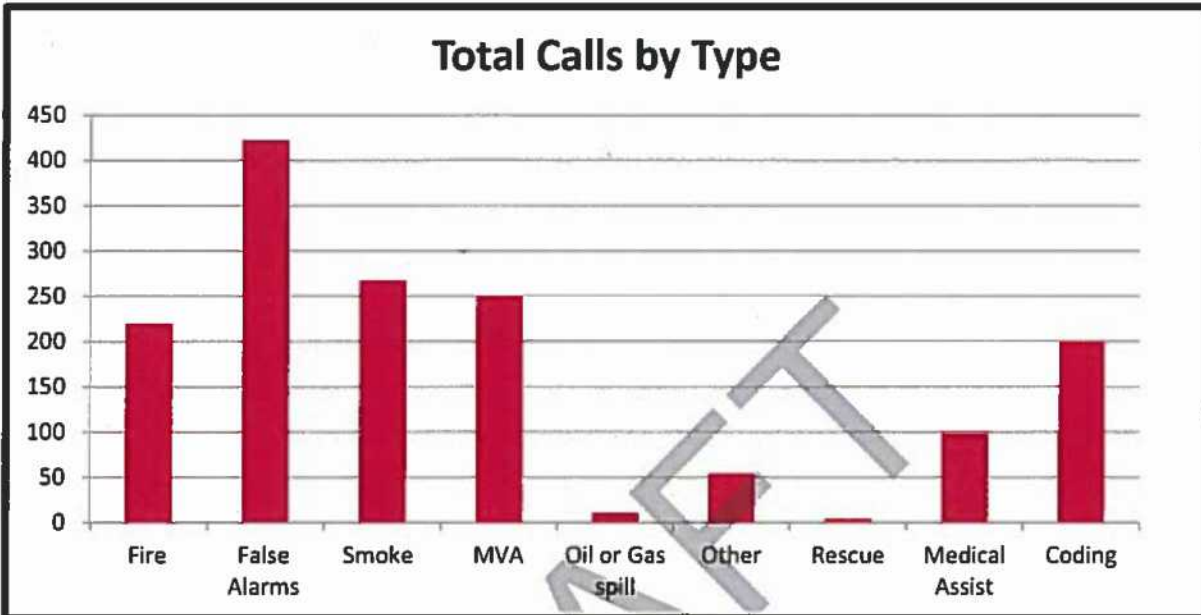


Figure 4 Emergency Calls by Incident Type (2010-2013)



The largest percentage of calls to Station 14 was False Alarm (detectors) fire calls. Currently there is a fine applied to false alarms but it was found to be minimal. The resulting cost of time, apparatus and personnel responding to a fire alarm should be considered when determining applicable fines. The fines should be increased so as to deter false alarms and encourage building owners to maintain and repair fire alarm systems rather than pay a fine for a false alarm. For motor vehicle accidents, the fire department should submit their invoice for services provided as a result of an accident involving a motor vehicle or for a loss to a motor vehicle (i.e. fire) to the Province.

In reviewing the emergency call data it was noted that improvements need to be made in the call reporting procedure. HRM should implement a standard around the time stamping of fire calls and review each month for conformance with the standard and conformance with the "Service Delivery Standards for Halifax Regional Fire and Emergency" for all portions of the call listed in the service delivery standard.



Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Within the HRM Relative Classifications for Emergency Communications, Fire Prevention and Safety Control were determined and applied as a single grade across the entire city.

Relative Classifications for Fire Department and Water Supplies were calculated specifically for individual areas as follows:

- Relative Classification for each Fire District i.e. the primary geographic response zone for each fire station (52 stations in 2013).
- Relative Classification for each Major Pressure Zone (SCADA zone) (3 distribution areas in 2013).

The Fire Department Assessment contributes 40 percent to the total Public Fire Protection Classification grade. This is the most heavily weighted portion of the grading and as such is considered to be the most significant indicator of a community or municipality's overall preparedness for dealing with fire emergencies.

[REDACTED] This forms the basis of the relative classification of the Fire Department.



Figure 5 Fire Department Item Weights

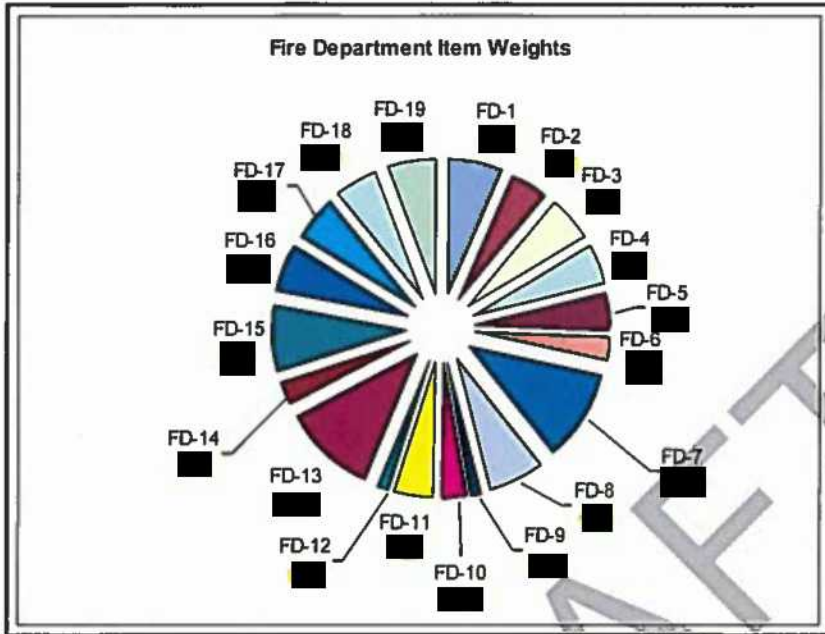


Figure 6 Fire Department Credit Points

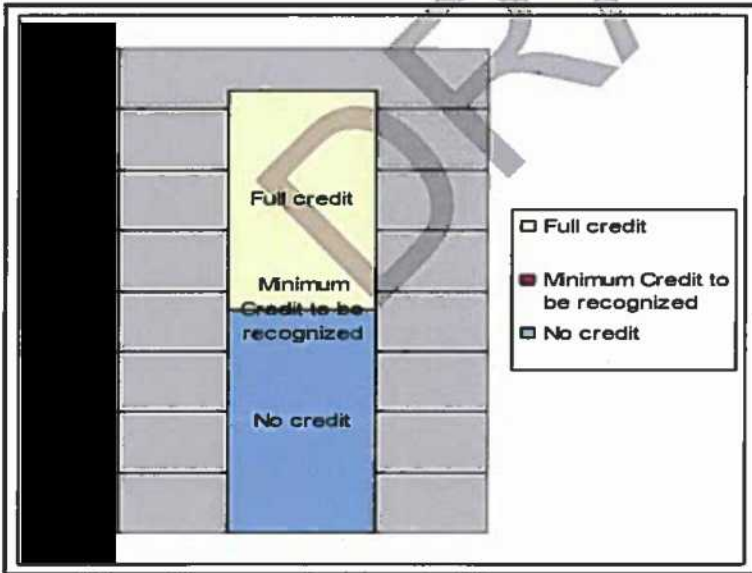
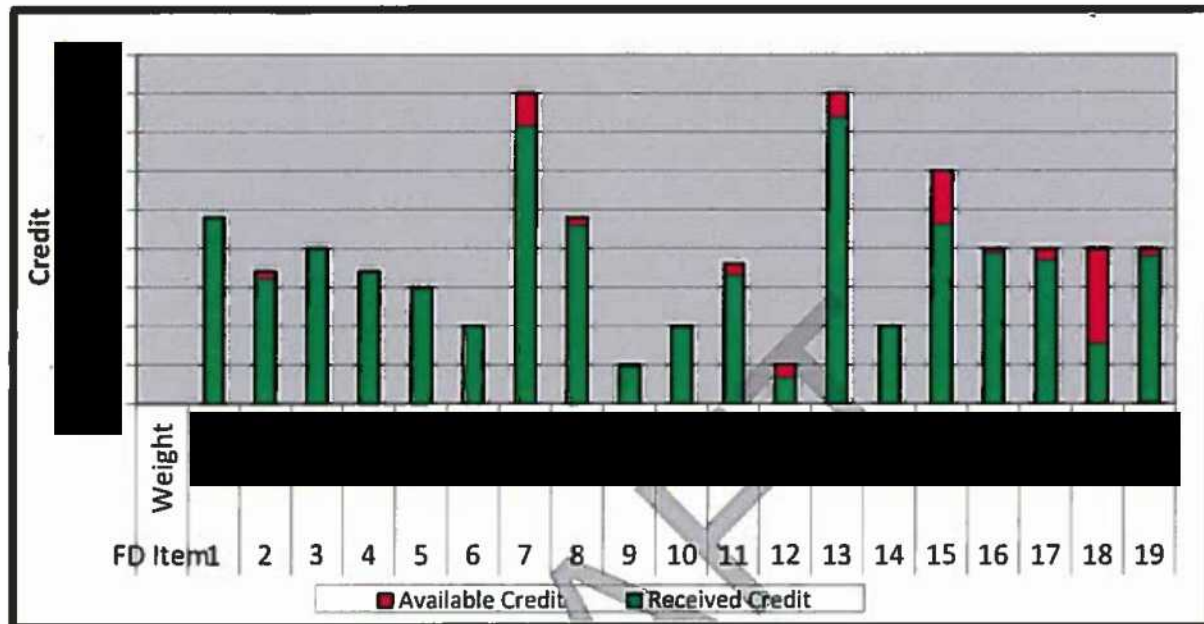


Table 7 Fire Department Grading Items Overall Summary

Grading Item	Category	Credit Received	Maximum Credit	% of FD	% of All
FD-1	Engine Service	240			
FD-2	Ladder Truck Service	161			
FD-3	Distribution of Companies and Type of Apparatus	200			
FD-4	Engine and Ladder Pump Capacity	170			
FD-5	Design, Maintenance and Condition of Apparatus	148			
FD-6	Number of Line Officers – Fire Suppression	100			
FD-7	Total Fire Force Available	358			
FD-8	Engine and Ladder Company Unit Manning	230			
FD-9	Master and Special Stream Devices	50			
FD-10	Equipment for Engines and Ladder Trucks, General	98			
FD-11	Fire Hose	166			
FD-12	Condition of Fire Hose	33			
FD-13	Training and Qualifications	369			
FD-14	Response to Alarms	100			
FD-15	Fire Ground Operations	231			
FD-16	Special Protection Required	194			
FD-17	Miscellaneous Factors and Conditions	185			
FD-18	Pre-Incident Planning	77			
FD-19	Administration	190			
Weight in Grading	40			Credit Received	32.20
Relative Classification					
2					



Figure 7 Fire Department Grading Items Overall Summary



Fire Station 14 was assigned a Relative Class of 2. The figure above shows each grading item of the fire department and how much credit was received and how much credit is still available within each grading item. The relative classification contributes to the overall Public Fire Protection Classification (PFPC) of Fire District 14 and that of the entire Halifax Regional Municipality. Factoring in the Water Supply, Fire Safety Control and Emergency Communication grading items, Fire Station 14 was assigned an overall Public Fire Protection Classification of 4. This indicates that the level of response is proportionate to the level of risk in the fire protection district. To maintain the firefighting capabilities and the credit received for fire insurance grading purposes, it is recommended that a minimum of four career fire fighters be maintained at Station 14.

Maintaining the Public Fire Protection Classification for Station 14 will ensure residents within the fire protection area receive the full benefit of available property insurance premium discounts based on the level of fire protection provided. In the event the Station 14 is downgraded from a PFPC 4 to PFPC 5 the resulting cost to the tax payer in the form of insurance premiums is approximately \$1,500,000.00 in insurance premium increases for the zone. These values are estimates only as insurance rates are dynamic and dependent on a large number of factors. A further point to consider is that as the PFPC



decreases in value, i.e. going from PFPC 5 to PFPC 4 the capacity of an insurer to underwrite in the City can change and in turn can create competition which can lower rates. It is difficult to quantify the true effects and figures given here are estimates.

Table 8 Premium Estimates under the Public Fire Protection Classification System – Response Zone 14

Public Fire Protection Classification	Total Premium Estimates Prior to FUS Study	Total Premium Estimates Post FUS Study	Total Premium Estimates Difference
3	\$2,436,535		
4		\$2,631,458	\$194,923
5		\$4,020,284	\$1,583,749

Recommendations

- Maintain four career fire fighters at Station 14.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 15
331 Pleasant Street



Station 15 is located at 331 Pleasant Street in the Woodside area of Dartmouth. The station exits onto Mt. Hope Avenue and is bordered by Pleasant Street to the south west. The station is located in a fairly central position for response to its overall coverage area. Figure 1 shows the 2.5 km, 5 km and 8 km coverage from Station 15.

Building and Tarmac

All fire stations should be of substantial construction, suitable for the service, and located and arranged for ease and quickness of response. Fire Station 15 is constructed of concrete and steel framing with wood frame floors and roof. The roof construction is wood frame with built up asphalt. The tarmac is a concrete covered area which extends from the bay door to the street. The tarmac area is sufficient for vehicle run ups and day routines.



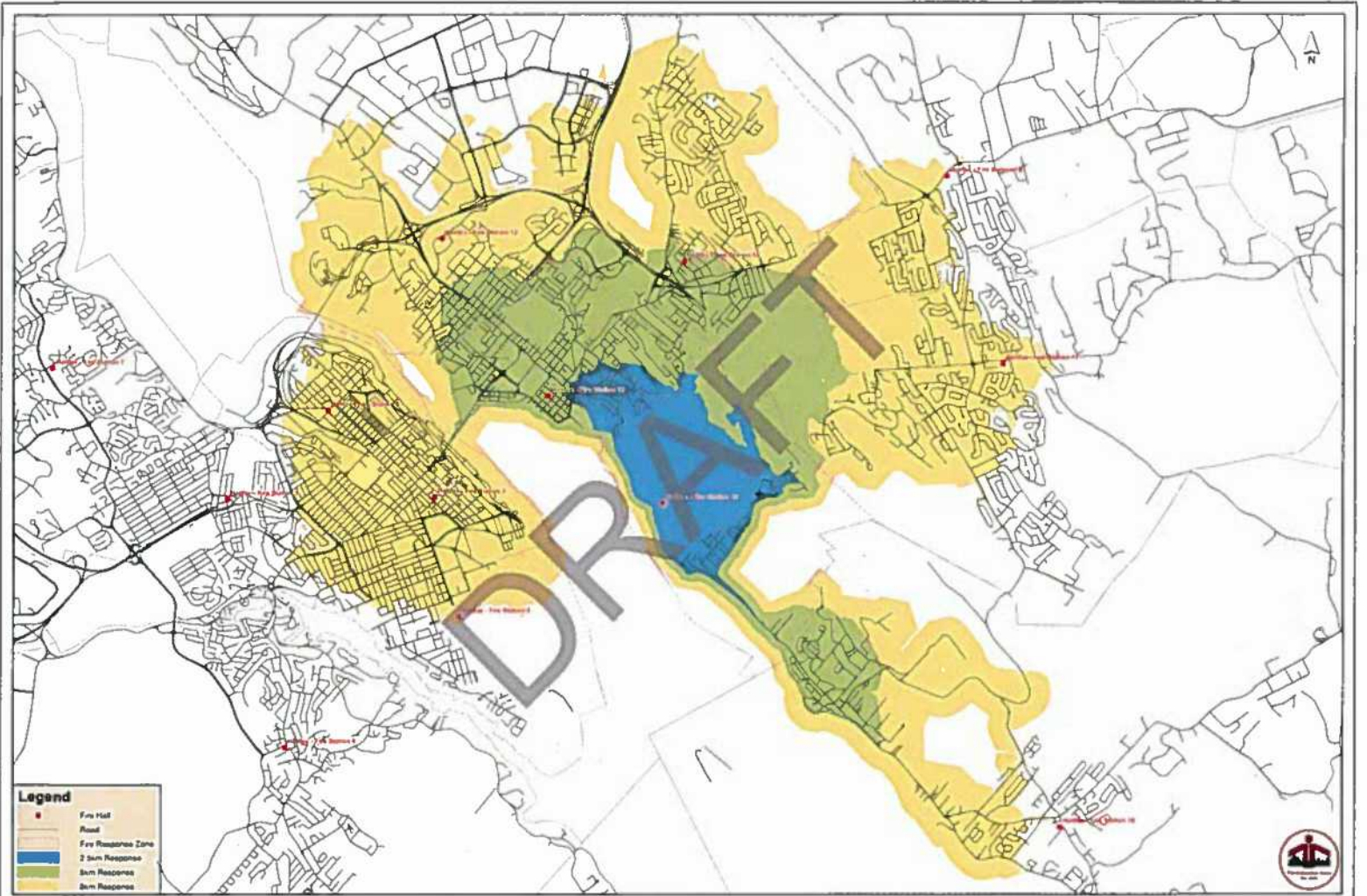


Figure 1 2.50/Skm Response from Fire Station 15

Scale = 1:17,000

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The station has sleeping quarters, a day room and kitchen. Apparatus bays are located in the same building. The second floor provides office space, accommodation and a living area (day room). The facilities at this station are sufficient to meet the needs of the staff.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

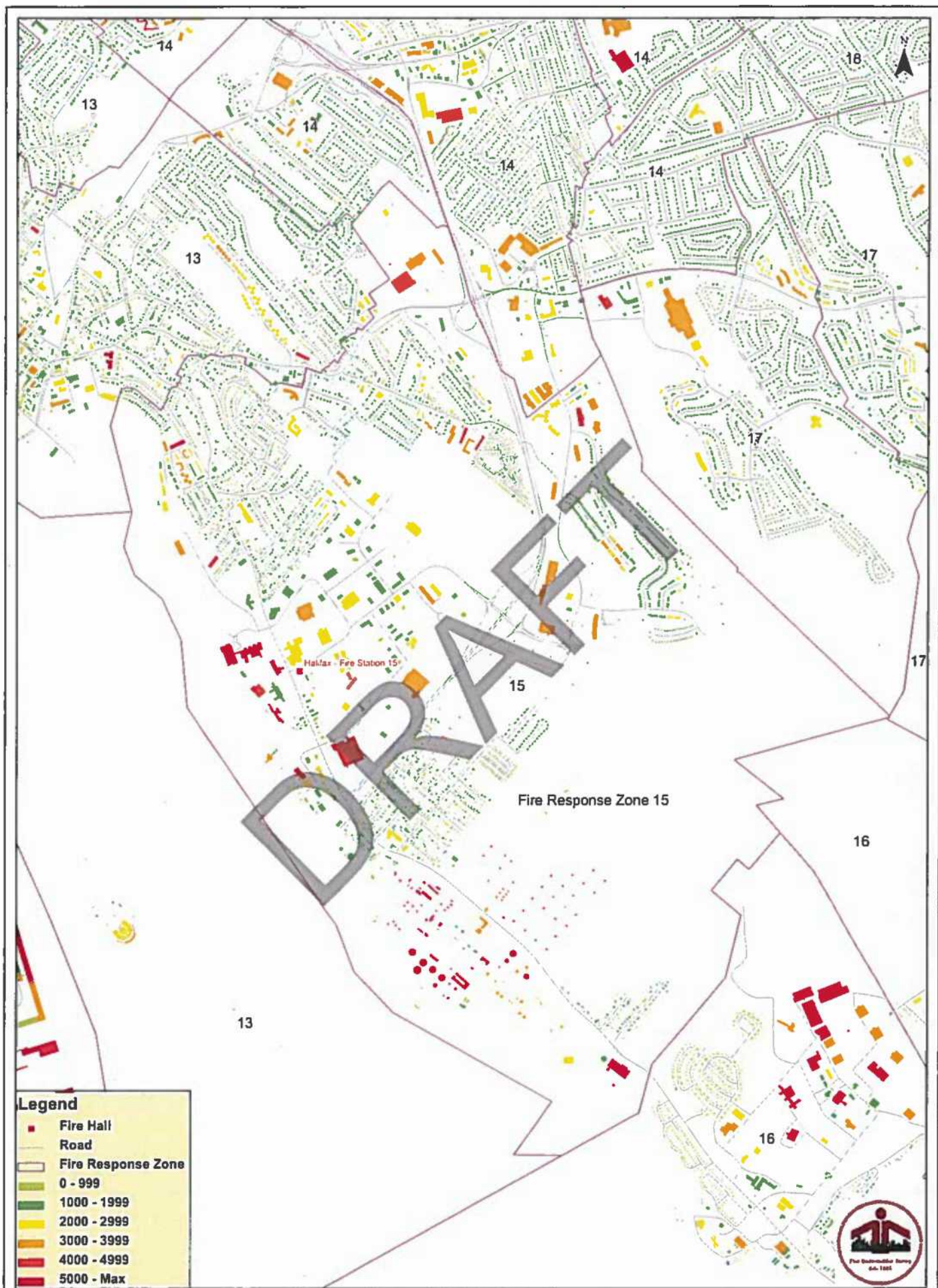
Community Risk Profile – Response Zone 15

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 2,726 Required Fire Flows were calculated for Response Zone 15 as shown in Figure 2 below. Table 1 below depicts the average Required Fire Flows calculated.

Table 1 Required Fire Flow ranges in Response Zone 15

RFI Range	No. of RFI points
0-999 IGPM	1,034
1,000-1,999 IGPM	1,499
2,000-2,999 IGPM	70
3,000-3,999 IGPM	39
4,000-4,999 IGPM	30
>=5,000 IGPM	54





In addition the Basic Fire Flow was determined for the response area. The Basic Fire Flow is usually calculated as the 95th percentile RFF value or the 5th highest in the Fire Response Area. Considerations are given to the exposure risk, quantity of risks, and type of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response Zone 15 is based on the fifth highest which is 7,000 Imperial Gallons per Minute.

Table 2 Basic Fire Flows for HRM Response Zone 15

Total RFF Points	2,726	
	IGPM	L/s
90th Percentile	1,600	121.28
95th Percentile	2,500	189.50
Max	10,000	758.00
5th highest	7,000	530.60

Apparatus & Personnel

Standard staffing for Station 15 is a 4 person 24/7 shift. Apparatus assignment for Station 15 is a single Engine.

Station 15 was evaluated for the number of Engine and Ladder companies in service relative to the overall fire potential and the area being protected. Apparatus are required to be adequately housed and staffed. Fire apparatus that serve dual purposes are evaluated based on the primary duty it serves on the fire ground. Based on the Basic Fire Flow, the apparatus requirements defined in the Fire Underwriters Survey - Table of Effective Response is as follows:

- First due Pumper Company in 2.5 minutes.
- Second due Pumper Company in 3.5 minutes.
- First due Ladder Company in 3.5 minutes.

The benchmark number of apparatus required is 9 Pumper companies in 8 minutes and 3 Ladder companies in 7 minutes. These requirements reflect the apparatus need to attain maximum credit in the Engine and Ladder items of the fire department grading and serve as a benchmark against which response is measured. Ladders received 50 percent credit as Engine apparatus and 100 percent credit as



Ladder apparatus. Fire Station 15 received credit for 6.2 Engines out of the maximum 9 Engine companies that can be credited for grading.

Table 3 Credited in Service Engine Summary

Station #	Vehicle Type	Apparatus Credit	Engine Credit	Reserve Engine Credit
15	Engine	100% Engine Credit	1	0
13	Quint	47% Engine Credit	0.47	0
14	Engine	25% Engine Credit	0.25	0
12	Quint	50% Engine Credit	0.5	0
3	Engine	100% Engine Credit	1	0
17	Engine	100% Engine Credit	1	0
17	Engine	100% Engine Credit	1	0
17	Pumper/Tanker	100% Engine Credit	1	0
	Engine	100% Reserve Credit	0	1
Total Engine Credit:			6.2	1
Maximum Credit Receivable (7,000 Igpm):			9	1

Currently there is only no Ladder stationed at Station 15. Response areas with five buildings that are 3 storeys or 10 m (35 ft.) or more in height, or districts that have a Basic Fire Flow greater than 3,300 IGPM, or any combination of these criteria, should have a Ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed Ladder companies for fire insurance grading to receive maximum credit. There are multiple buildings within the HRM Response Zone 15 that are three storeys or more in height. In addition several of the calculated Required Fire Flows were greater than 3,300 IGPM.

Fire Station 15 received Support Ladder Credit for ladder apparatus from Stations 3, 13, and 12. The credit received for Support Ladders was downgraded based on the distance from the responding hall. Station 15 received credit for 2.93 Ladders out of the maximum 4 Ladder companies that can be credited for grading.



Table 4 Credited in Service Ladder Summary

Station #	Vehicle Type	Apparatus Credit	Ladder Credit	Reserve Ladder Credit
3	Ladder	100% Ladder Credit	1	0
13	Quint	93% Ladder Credit	0.93	0
12	Quint	100% Ladder Credit	1	0
	Ladder	100% Reserve Credit	0	1
Total Ladder/Reserve Ladder Credit:			2.93	1
Maximum Credit Receivable (7,000 Igpm):			4	1

Consideration should be given to adding a Quint to the Station 15 fleet. The Quint would be required primarily to provide emergency response support to the tank farms so as to provide a secondary water supply which would boost the built in extinguishing systems at these facilities. In the event that the built in systems fail to activate, the Quint would provide first response and a primary water supply. With the current apparatus at Station 15 the total pump capacity to provide an adequate, steady water supply in such an event is insufficient. Table 5 below provides the calculated pump and tank capacities that would be required based on the storage tank sizes and fuels stored. Based on the calculations provided in Table 5, it is shown that the Quint should not have less than a 1,750 Imperial Gallon per minute pump and a nozzle at the tip of the ladder for elevated water application. In addition, the apparatus should not have less than a 200 Imperial Gallon foam tank if using a 0.1% foam concentrate or a 1,000 Imperial Gallon foam tank if using a 0.5% concentrate. The recommended foam unit is a Husky 30 or equal unit, giving the department the required foam solution capacities of up to 1% foam concentrate.

However due to the overall dimensions of a Quint, it is unlikely that the apparatus will fit in Station 15 apparatus bay without extensive renovations to the building. An alternative would be to place the Quint at Station 17. As the tank farms are considered a specialized risk, the location of the Quint will not impact the fire insurance grades for Station 15's response area.



Table 5 Required Fire Flows based on a two hour duration tank fire

Tank Diameter (FT)	Tank Surface Area (Square FT)	Application Rate USGPM	Application Rate IGPM	Flash Point of Fuel at 100°F (min)
50	1,963	196	165	120
100	7,854	785	659	120
125	12,272	1,227	1,029	120
150	17,671	1,767	1,482	120
200	31,416	3,142	2,635	120

Staffing at Station 15 was evaluated in its ability to meet the staffing requirements as determined by the Basic Fire Flow benchmark from the Table of Effective Response. The staffing was measured against the FUS benchmark of at least six competent career fire fighters available and assigned to respond to fire for duty with each required Engine and Ladder Company. The number of first due (initial response) engine companies and ladder companies based on the benchmark Basic Fire Flow of 7,000 IGPM is three engine companies and one Ladder Company. The maximum credit that Station 15 can receive for initial available fire force response for three engine companies and one Ladder Company is 24 fire fighters. NFPA 1710 requires each fire apparatus to be staffed with a minimum of four personnel. The current response from Station 15 is a single engine staffed with four fire fighters with support from Fire Stations in the urban core. It is recommended that an additional crew be placed in Station 15 to improve the available fire force required for initial response.

Station Location

Station 15 is well located in Dartmouth. The highest concentration of industrial and specialized risks in HRM including an oil refinery, petroleum bulk storage (tank farm) and two hospitals are located within Station 15 fire protection area. These risks require the placement of an aerial apparatus at Station 15. Figure 1 identifies the 2.5 km, 5 km and 8 km coverage areas for Station 15. The blue area is the 2.5 km response zone which is represents the ideal coverage for buildings with high Required Fire Flows. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area



represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

Fire calls

Figure 3 shows the response of Station 15 based on its historical calls for the years 2010 to 2013. Station 15 responded to an average of 256 calls per year in the 45 months reviewed. The following table is a breakdown of the calls from 2010 to September 2013. Table 6 shows the breakdown of emergency calls by incident type. The calls per year numbers for 2013 reflect the first 9 months of 2013.

Table 6 Total Emergency calls per year.

Total Calls per Year 2010 - 2013	
Year	No. of Calls
2010	251
2011	258
2012	279
2013	175

Table 7 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	122	33	12.7
False alarm	363	97	37.7
Smoke	164	44	17.0
Motor Vehicle Accident	126	34	13.1
Oil or Gas spill	8	2	0.8
Other	21	6	2.2
Rescue	3	0.8	0.3
Medical Assist	78	21	8.1
Coding	78	21	8.1



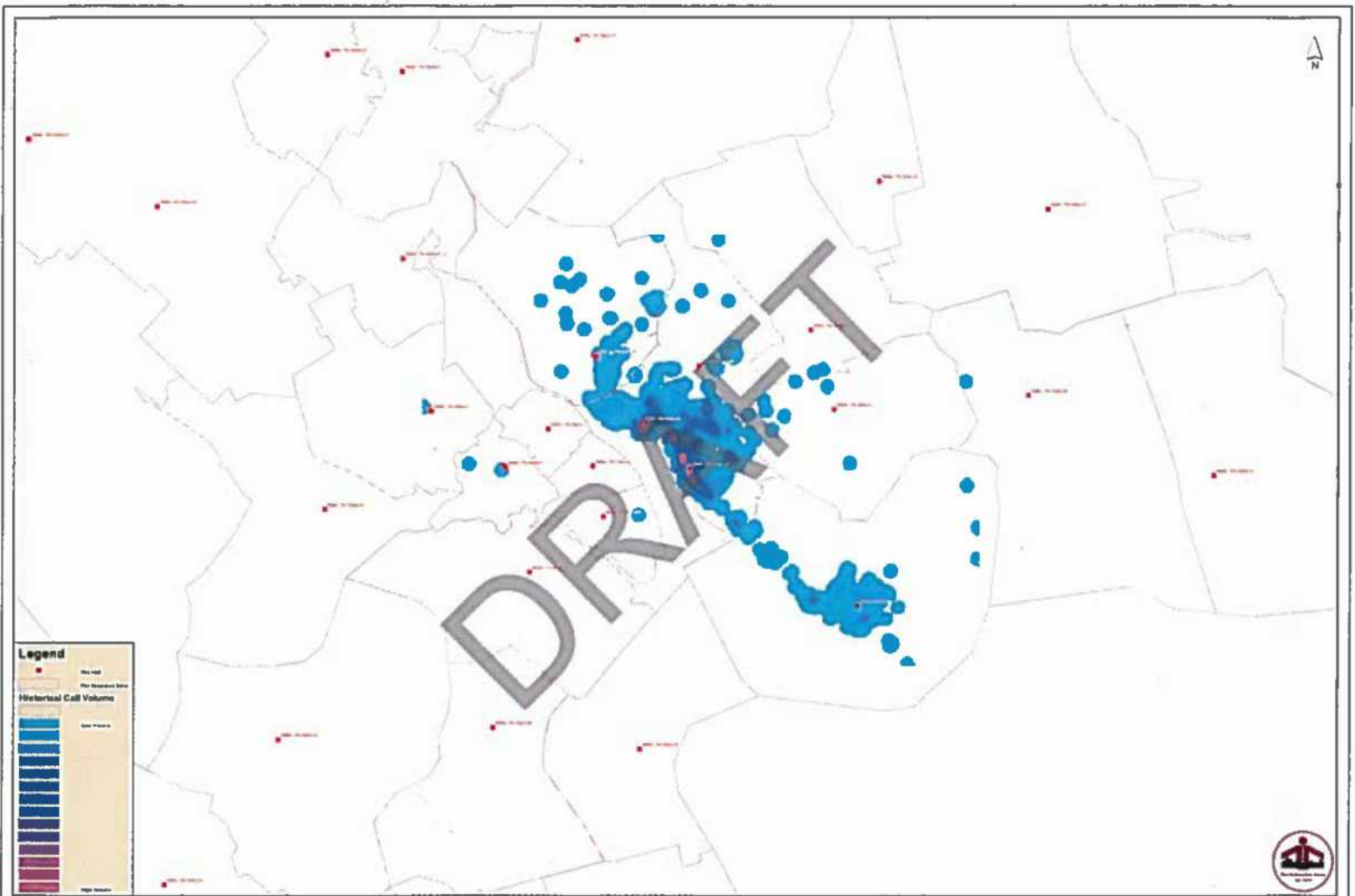
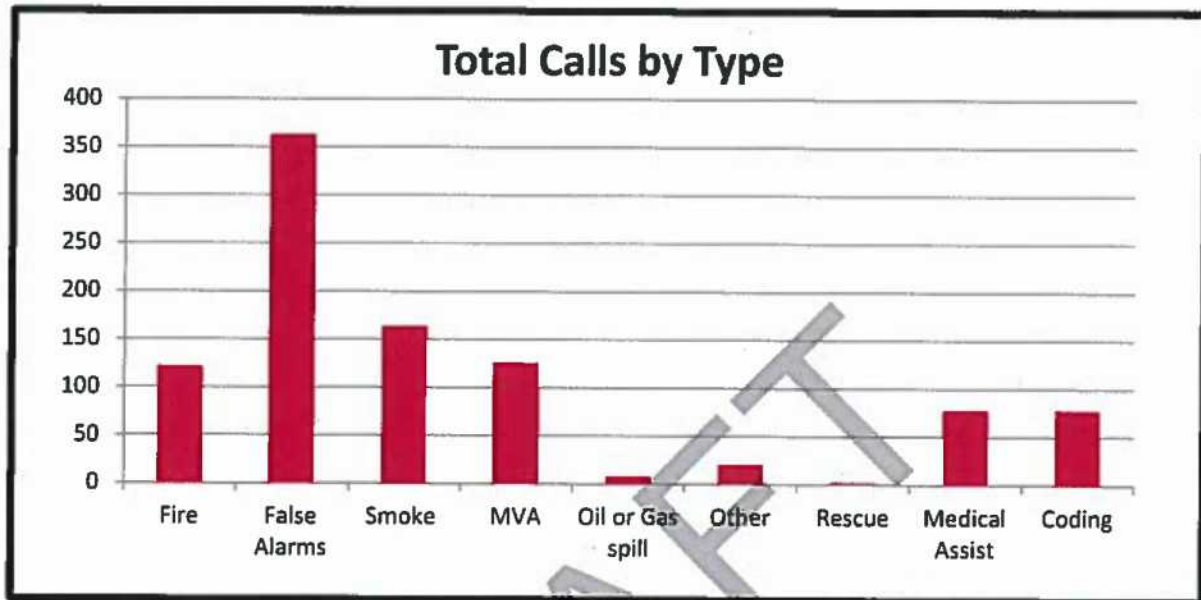


Figure 3 Historical Call Map - Fire Station 15

Scale = 1:40,000

Figure 4 Emergency Calls by Incident Type



The largest percentage of calls to Station 15 was False Alarm (detectors) fire calls. Currently there is a fine applied to false alarms but it was found to be minimal. The resulting cost of time, apparatus and personnel responding to a fire alarm should be considered when determining applicable fines. The fines should be increased so as to deter false alarms and encourage building owners to maintain and repair fire alarm systems rather than pay a fine for a false alarm. There were several motor vehicle accident calls. Motor Vehicle Accidents have a fund in Nova Scotia created by the provincial government and calls should be billed out by the City to the province. Fire departments can submit their invoice for services provided as a result of an accident involving a motor vehicle or for a loss to a motor vehicle (i.e. fire) to the Province.

In reviewing the emergency call data it was noted that improvements need to be made in the call reporting procedure. HRM should implement a standard around the time stamping of fire calls and review each month for conformance with the standard and conformance with the "Service Delivery Standards for Halifax Regional Fire and Emergency" for all portions of the call listed in the service delivery standard.



Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Within the HRM Relative Classifications for Emergency Communications, Fire Prevention and Safety Control were determined and applied as a single grade across the entire city.

Relative Classifications for Fire Department and Water Supplies were calculated specifically for individual areas as follows:

- Relative Classification for each Fire District i.e. the primary geographic response zone for each fire station (52 stations in 2013).
- Relative Classification for each Major Pressure Zone (SCADA zone) (17 zones in 2013).

The Fire Department Assessment contributes 40 percent to the total Public Fire Protection Classification grade. This is the most heavily weighted portion of the grading and as such is considered to be the most significant indicator of a community or municipality's overall preparedness for dealing with fire emergencies.

[REDACTED] This forms the basis of the relative classification of the Fire Department.



Figure 5 Fire Department Item Weights

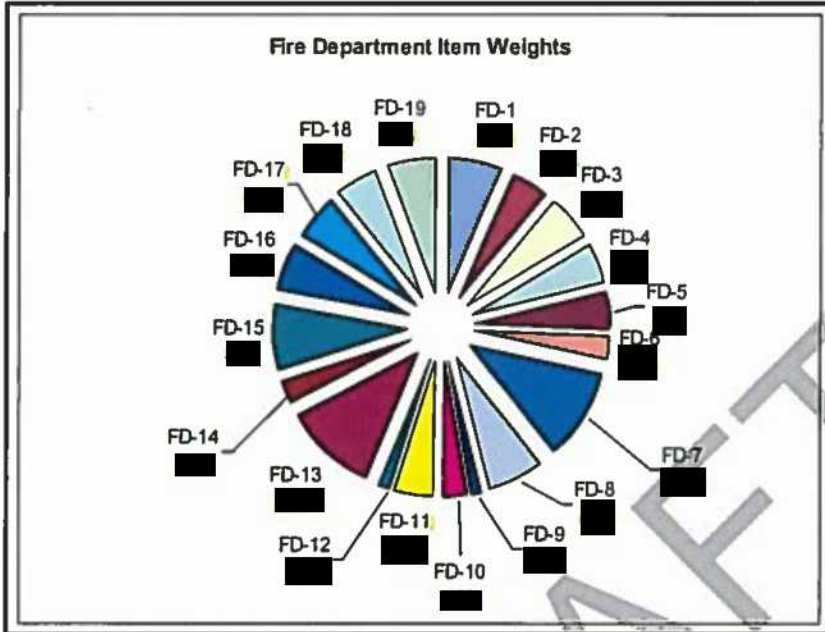


Figure 6 Fire Department Credit Points

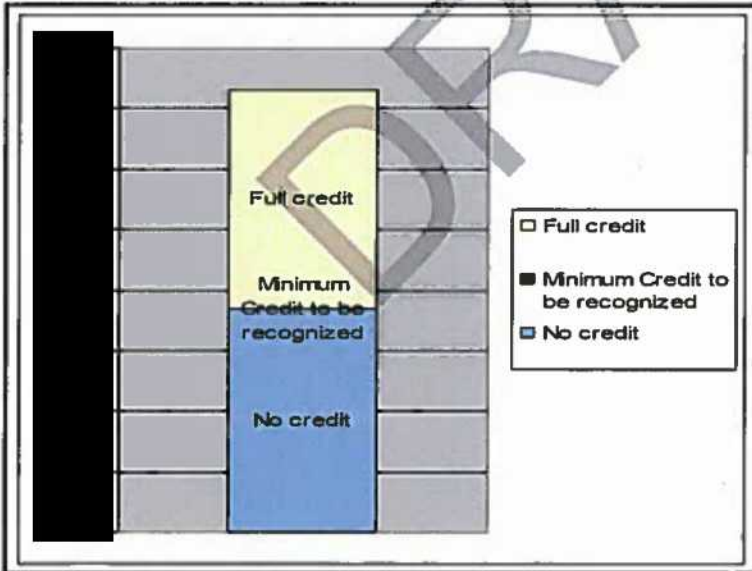
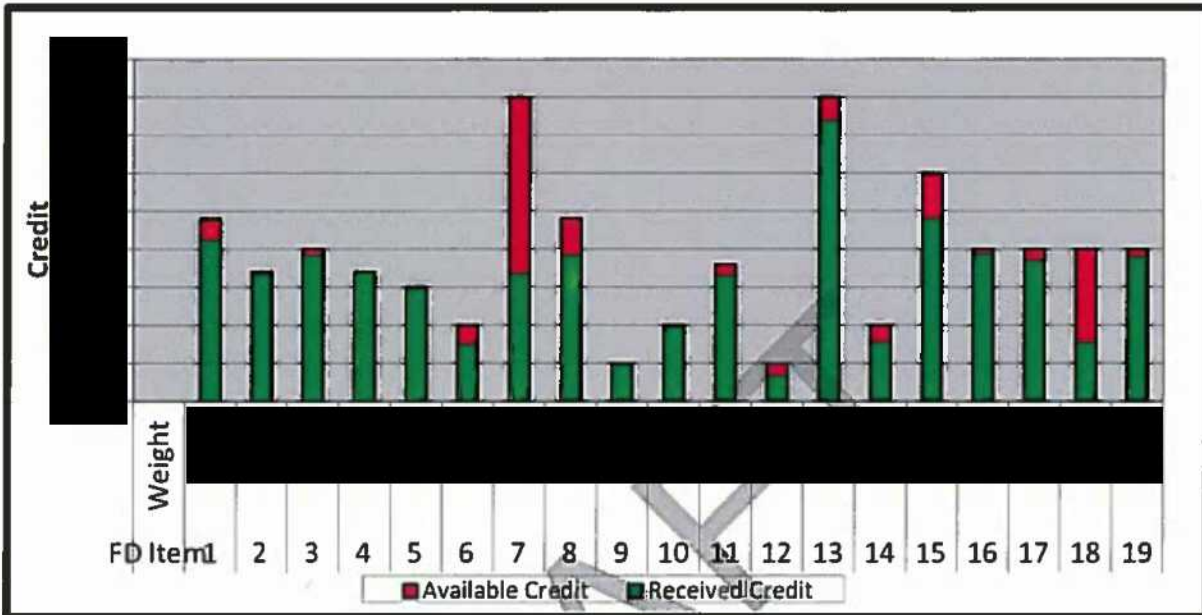


Table 8 Fire Department Grading Items Overall Summary

Grading Item	Category	Credit Received	Maximum Credit	% of FD	% of All
FD-1	Engine Service	212			
FD-2	Ladder Truck Service	167			
FD-3	Distribution of Companies and Type of Apparatus	192			
FD-4	Engine and Ladder Pump Capacity	170			
FD-5	Design, Maintenance and Condition of Apparatus	148			
FD-6	Number of Line Officers – Fire Suppression	75			
FD-7	Total Fire Force Available	168			
FD-8	Engine and Ladder Company Unit Manning	192			
FD-9	Master and Special Stream Devices	50			
FD-10	Equipment for Engines and Ladder Trucks, General	98			
FD-11	Fire Hose	165			
FD-12	Condition of Fire Hose	33			
FD-13	Training and Qualifications	369			
FD-14	Response to Alarms	78			
FD-15	Fire Ground Operations	240			
FD-16	Special Protection Required	194			
FD-17	Miscellaneous Factors and Conditions	185			
FD-18	Pre-Incident Planning	77			
FD-19	Administration	190			
Weight in Grading	40			Credit Received	25.60
Relative Classification					
4					



Figure 7 Fire Department Grading Items Overall Summary



Fire Station 15 was assigned a Relative Classification of 4. The figure above shows each grading item of the fire department and how much credit was received and how much credit is still available within each grading item. The relative classification contributes to the overall Public Fire Protection Classification (PFPC) of Fire District 15 and that of the entire Halifax Regional Municipality. Factoring in the Water Supply, Fire Safety Control and Emergency Communication grading items, Fire Station 15 was assigned an overall Public Fire Protection Classification of 4. In order to maintain the current level of grading the need for the Aerial and crew will have to be addressed along with apparatus and staffing for the station.

Maintaining the Public Fire Protection Classification for Station 15 will ensure residents within the fire protection area receive the full benefit of available property insurance premium discounts based on the level of fire protection provided. In the event the Station 15 is downgraded the resulting cost to the tax payer in the form of insurance costs is approximately \$480,000.00 in insurance premium rate increases for the zone. These values are estimates only as insurance rates are dynamic and dependent on a large number of factors. These values are estimates only as insurance rates are dynamic and dependent on a large number of factors. A further point to consider is that as the PFPC decreases in value, i.e. going



from PFPC 5 to PFPC 4 the capacity of an insurer to underwrite in the City can change and in turn can create competition which can lower rates. It is difficult to quantify the true effects and figures given here are estimates.

Table 9 Premium Estimates under the Public Fire Protection Classification System – Response Zone 15

Public Fire Protection Classification	Total Premium Estimates Prior to FUS Study	Total Premium Estimates Post FUS Study	Total Premium Estimates Difference
3	\$5,985,543		
4		\$6,464,387	\$478,844
5		\$9,876,147	\$3,890,604

Recommendations

- Place a Quint in Station 15. However due to the overall dimensions of a Quint, the apparatus may not fit in Station 15 apparatus bays without extensive renovations to the building. An alternative would be to place the Quint at Station 17. As the tank farms are considered a specialized risk, the location of the Quint will not impact the fire insurance grades for Station 15's response area.
- Assign a four person crew in addition to the four fire fighters currently at Station 15 to attain minimum staffing of 8.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 16
1807 Caldwell Road



Station 16 is located at 1807 Caldwell Road in Eastern Passage and is bordered by Caldwell Road to the east, and a commercial property to the west. The station is located in a fairly central position for response to its overall coverage area. Figure 1 shows the 2.5 km, 5 km and 8 km coverage from Station 16.

Building and Tarmac

All fire stations should be of substantial construction, suitable for the service, and located and arranged for ease and quickness of response. The building is constructed of concrete block with the brick veneer cladding and the roof consists of a metal roof covering. The tarmac is an asphalt covered area which extends from the bay door to the street. The tarmac area is sufficient for vehicle run ups and day routines.



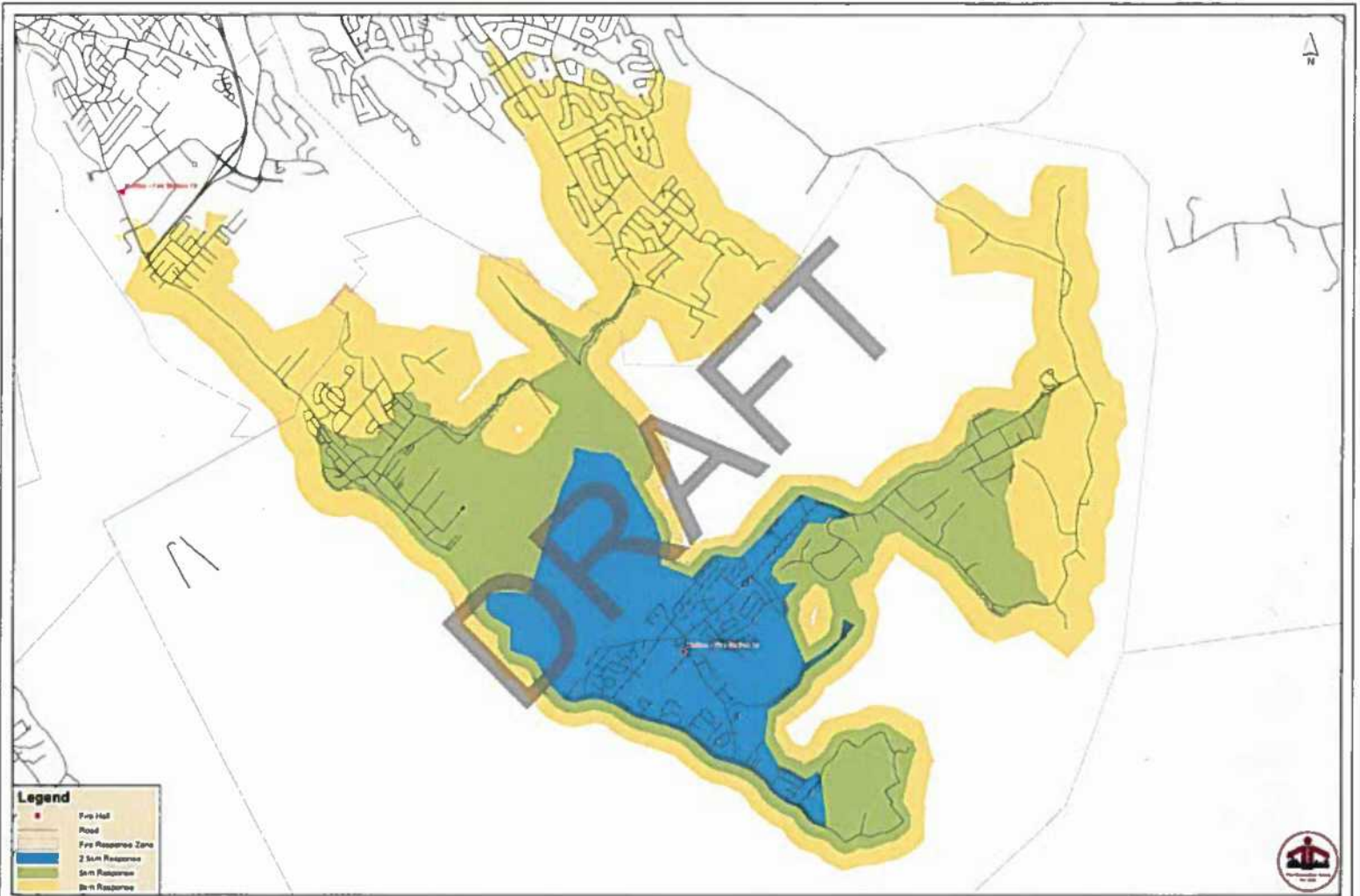


Figure 1.2 5/5/8km Response from Fire Station 18

Scale = 1:12,000

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. A kitchen area, sleeping quarters, a day room and a captain's office are located in the building. Apparatus bays are located in the same building. The facilities at this station are adequate to meet the needs of the staff.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

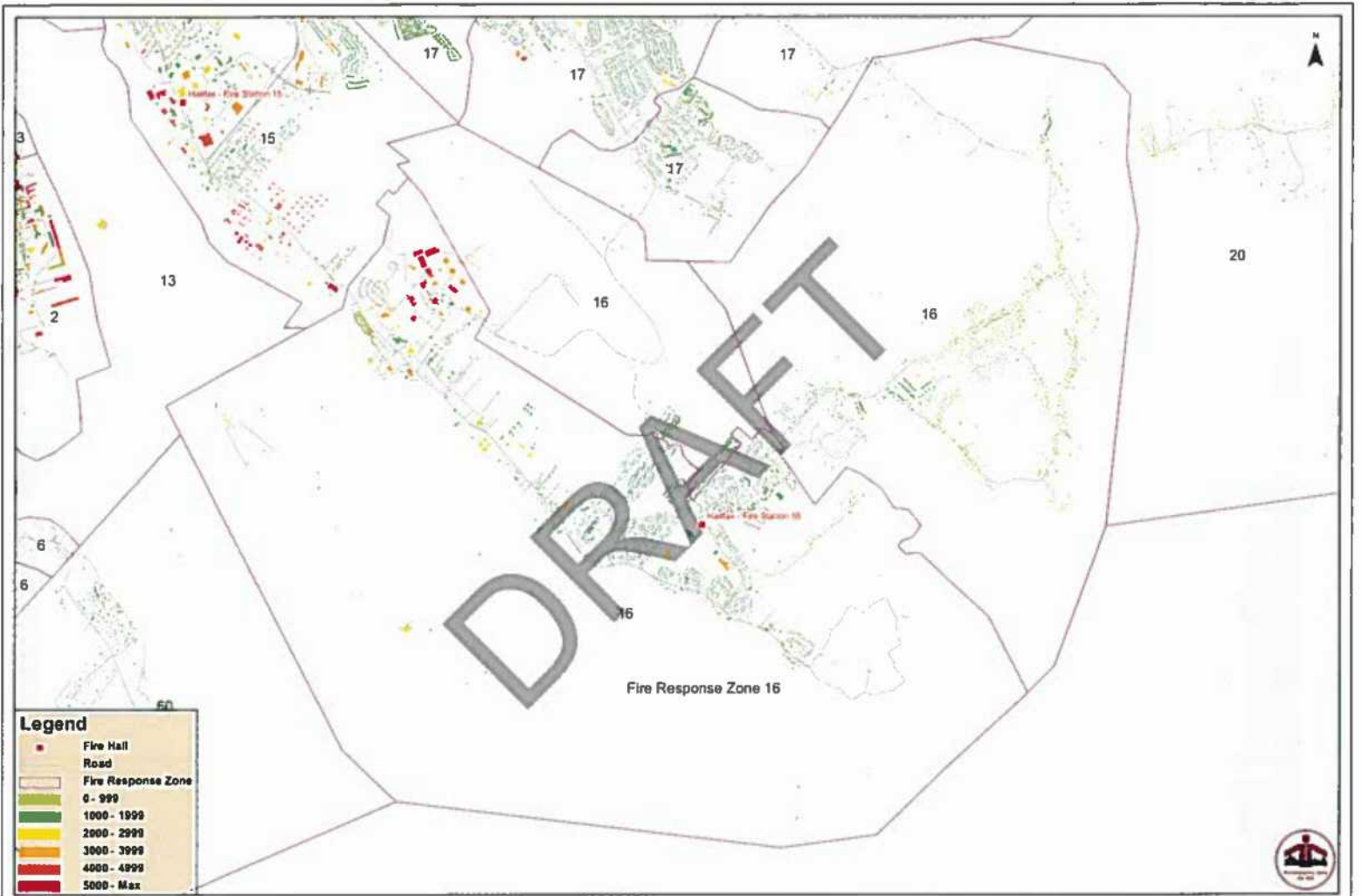
Community Risk Profile – Response Zone 16

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 4,555 Required Fire Flows were calculated for Response Zone 16 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 16

RFF Range	No. of RFF points
0-999 IGPM	1,846
1,000-1,999 IGPM	2,654
2,000-2,999 IGPM	30
3,000-3,999 IGPM	15
4,000-4,999 IGPM	3
$\geq 5,000$ IGPM	7





In addition the Basic Fire Flow was determined for the response area. The Basic Fire Flow is usually calculated as the 95th percentile RFF value or the 5th highest in the Fire Response Area. Considerations are given to the exposure risk, quantity of risks, and type of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response Zone 16 is based on the 95th percentile which is 1,400 Imperial Gallons per Minute.

Table 2 Basic Fire Flows for HRM Response Zone 16

Total RFF Points	4,555	
	IGPM	L/s
90th Percentile	1,400	106.12
95th Percentile	1,400	106.12
Max	7,700	583.66
5th highest	5,700	432.06

Apparatus & Personnel

Standard staffing for Station 16 is a 3 person 24/7 shift and a complement of 8 volunteers. Apparatus assignment for Station 16 is one Engine and one Pumper/Tanker.

Station 16 was evaluated for the number of Engine and Ladder companies in service relative to the overall fire potential and the area being protected. Apparatus are required to be adequately housed and staffed. Fire apparatus that serve dual purposes are evaluated based on the primary duty it serves on the fire ground. The Total Credited Engine Companies is calculated [REDACTED]

[REDACTED] The credit may be downgraded from 100 percent based on reliability factors such as age, quality, listing, pump test results and distance.

Based on the Basic Fire Flow of 1,400 IGPM, the apparatus requirements for Fire Station 16 as defined in the Fire Underwriters Survey - Table of Effective Response is as follows:

- First due Pumper Company in 3.5 minutes.
- Second due Pumper Company in 5 minutes.



- First due Ladder Company in 4 minutes (if required by hazards).

The benchmark number of apparatus required is 2 Pumper companies in 5 minutes. These requirements reflect the apparatus need to attain maximum credit in the Engine and Ladder items of the fire department grading and serve as a benchmark against which response is measured. Ladders received 50 percent credit as Engine apparatus and 100 percent credit as Ladder apparatus. Fire Station 16 received credit for 2 Engines out of the maximum 2 Engine companies that can be credited for grading.

Table 3 Credited in Service Engine Summary

Station #	Vehicle Type	Apparatus Credit	Engine Credit	Reserve Engine Credit
16	Engine	100% Engine Credit	1	0
16	Pumper/Tanker	100% Engine Credit	1	0
	Engine	100% Reserve Credit	0	1
Total Engine Credit:			2	1
Maximum Credit Receivable (1,400 Igpm):			2	1

Response areas with five buildings that are 3 storeys or 10 m (35 ft) or more in height, or districts that have a Basic Fire Flow greater than 3,300 IGPM, or any combination of these criteria, should have a Ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed Ladder companies for fire insurance grading to receive maximum credit. There is no Ladder requirement for Station 16.

Staffing at Station 16 was evaluated in its ability to meet the staffing requirements as determined by the Basic Fire Flow benchmark from the Table of Effective Response. The total available fire force grading item is weighted heavily within the fire insurance grading of the fire department. The staffing was measured against the FUS benchmark of at least six competent career fire fighters available and assigned to respond to fire for duty with each required Engine and Ladder Company. The number of first due (initial response) engine companies and ladder companies based on the benchmark Basic Fire Flow of 1,400 IGPM is two Engine companies. The maximum credit that Station 16 can receive for initial available fire force response for two engine companies is 12 fire fighters. NFPA 1710 requires each fire apparatus to be staffed with a minimum of four personnel. The current initial response from Station 16



is three fire fighters. The station was therefore credited with three fire fighters available for initial response out of the maximum 12 fire fighters that can be credited.

Station Location

Station 16 is well located for response. Figure 1 identifies the 2.5 km, 5 km and 8 km coverage areas for Station 16. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

Fire calls

The historical calls for Station 16 cover a large area of the HRM. Figure 3 shows the response of Station 16 based on its historical calls for the years 2010 to 2013. Station 16 responded to an average of 338 calls per year in the 45 months reviewed. Table 4 below is a breakdown of the calls from 2010 to September 2013. The total for 2013 reflects the emergency calls for the first 9 months of the year. Table 5 shows the breakdown of emergency calls by incident type. The year average was calculated for all calls over the 45 months.

Table 4 Total Emergency calls per year

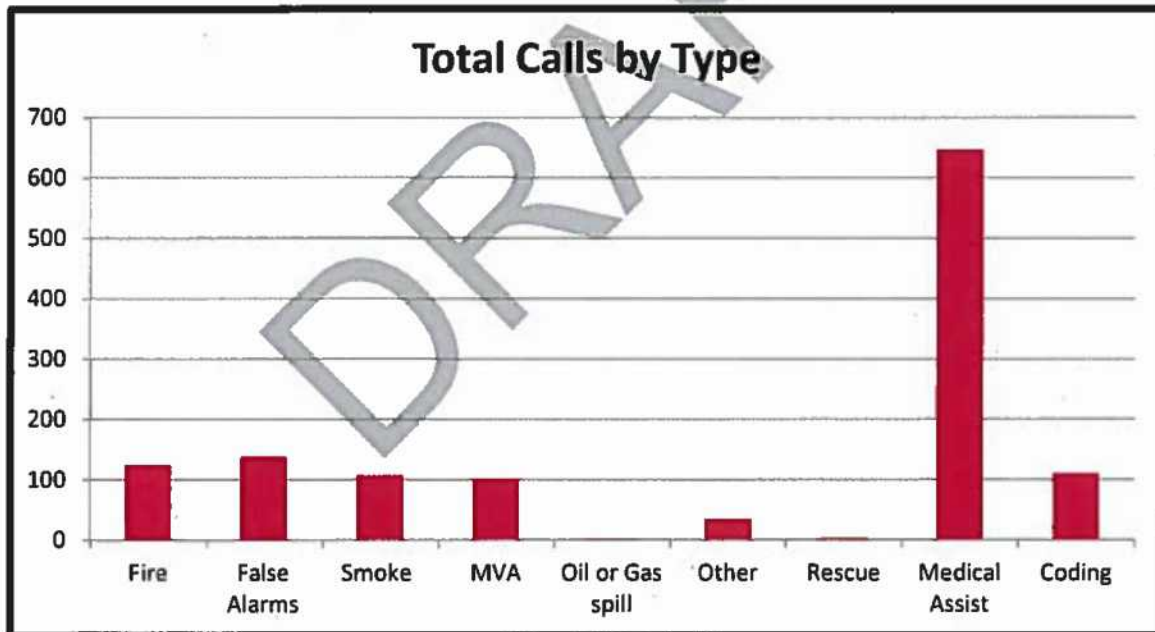
Total Calls per Year 2010 - 2013	
Year	No. of Calls
2010	347
2011	315
2012	365
2013	242



Table 5 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	124	33	9.8
False alarm	138	37	10.9
Smoke	107	29	8.4
Motor Vehicle Accident	100	27	7.9
Oil or Gas spill	3	0.8	0.2
Other	35	9	2.8
Rescue	4	1.1	0.3
Medical Assist	647	173	51.0
Coding	111	30	8.4

Figure 3 Emergency Calls by Incident Type (2010-2013)



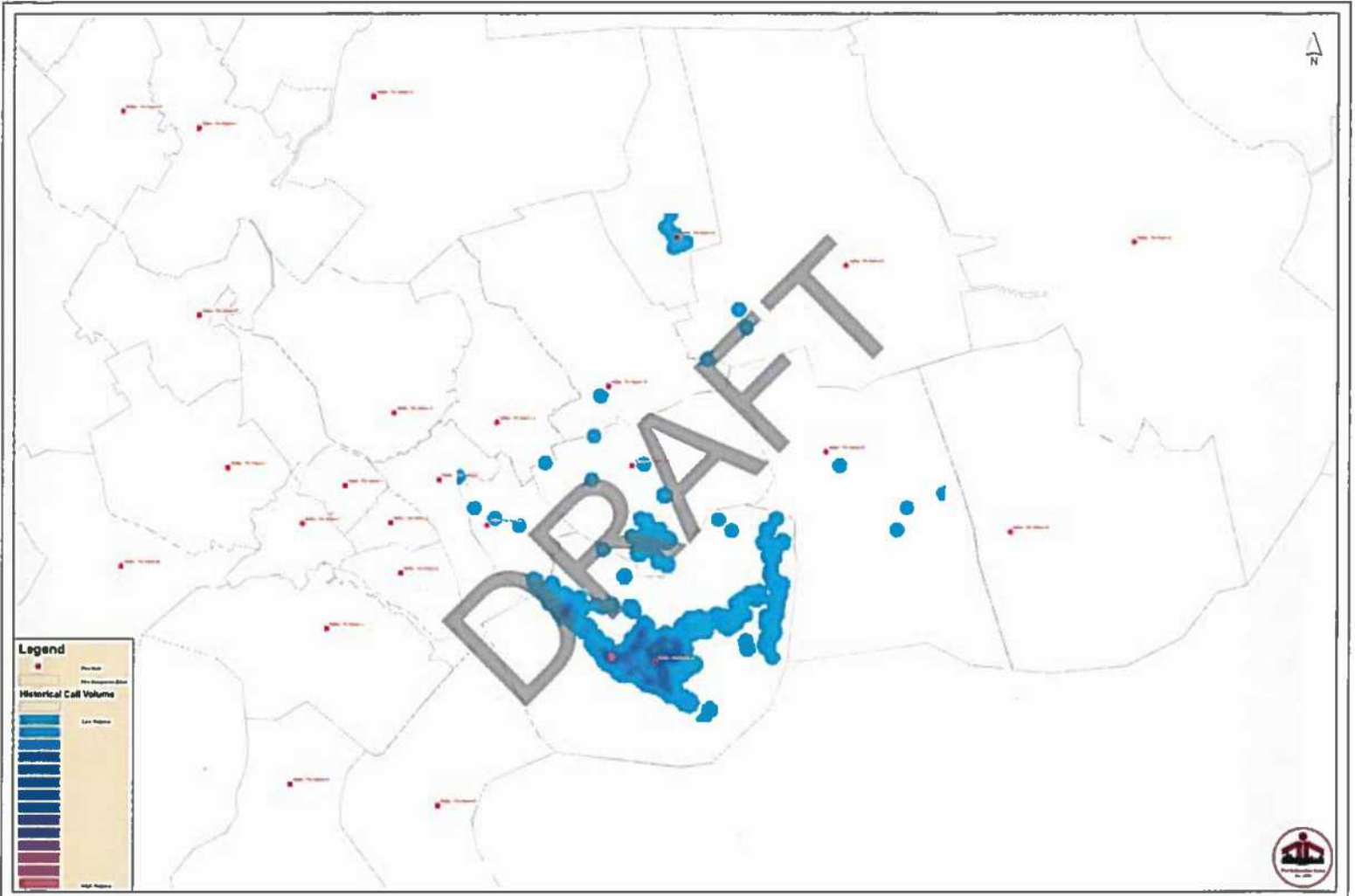


Figure 4 Historical Call Map - Fire Station 16

Scale = 1:40,000

The largest percentage of calls to Station 16 was medical assist calls. For motor vehicle accidents, the fire department should submit their invoice for services provided as a result of an accident involving a motor vehicle or for a loss to a motor vehicle (i.e. fire) to the Province.

In reviewing the emergency call data it was noted that improvements need to be made in the call reporting procedure. HRM should implement a standard around the time stamping of fire calls and review each month for conformance with the standard and conformance with the "Service Delivery Standards for Halifax Regional Fire and Emergency" for all portions of the call listed in the service delivery standard.

Fire Insurance Grading


Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Within the HRM Relative Classifications for Emergency Communications, Fire Prevention and Safety Control were determined and applied as a single grade across the entire city.

Relative Classifications for Fire Department and Water Supplies were calculated specifically for individual areas as follows:

- Relative Classification for each Fire District i.e. the primary geographic response zone for each fire station (52 stations in 2013).
- Relative Classification for each Major Pressure Zone (SCADA zone) (3 distribution areas in 2013).

The Fire Department Assessment contributes 40 percent to the total Public Fire Protection Classification grade. This is the most heavily weighted portion of the grading and as such is considered to be the most significant indicator of a community or municipality's overall preparedness for dealing with fire emergencies.



[Redacted] This forms the basis of the relative classification of the Fire Department.

Figure 5 Fire Department Item Weights

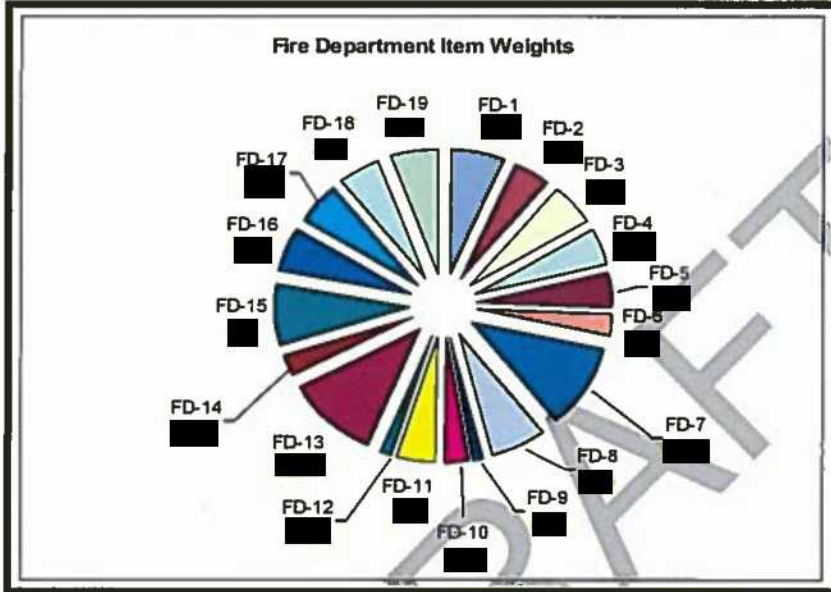


Figure 6 Fire Department Credit Points

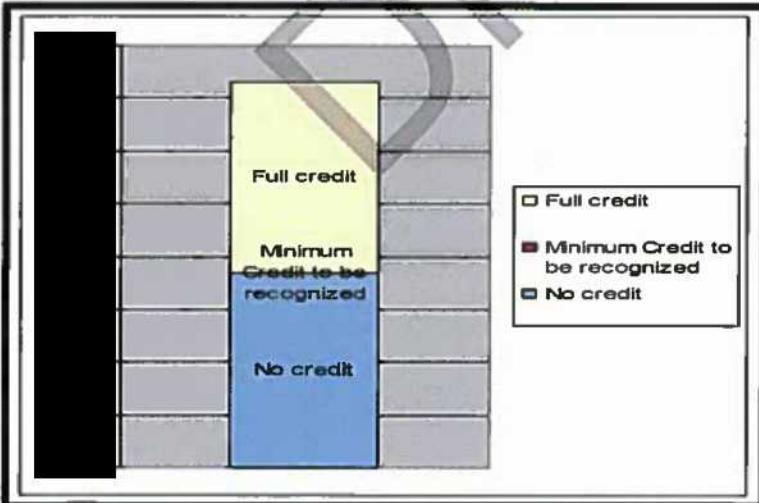
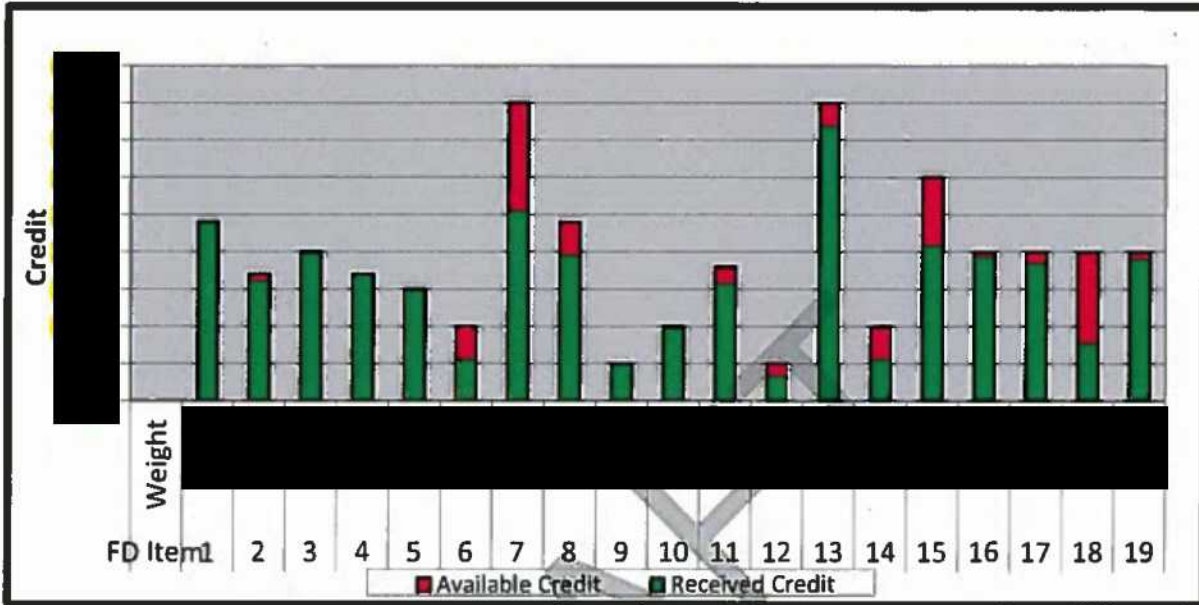


Table 6 Fire Department Grading Items Overall Summary

Grading Item	Category	Credit Received	Maximum Credit	% of FD	% of All
FD-1	Engine Service	240			
FD-2	Ladder Truck Service	161			
FD-3	Distribution of Companies and Type of Apparatus	200			
FD-4	Engine and Ladder Pump Capacity	170			
FD-5	Design, Maintenance and Condition of Apparatus	148			
FD-6	Number of Line Officers – Fire Suppression	55			
FD-7	Total Fire Force Available	255			
FD-8	Engine and Ladder Company Unit Manning	195			
FD-9	Master and Special Stream Devices	50			
FD-10	Equipment for Engines and Ladder Trucks, General	98			
FD-11	Fire Hose	157			
FD-12	Condition of Fire Hose	33			
FD-13	Training and Qualifications	369			
FD-14	Response to Alarms	55			
FD-15	Fire Ground Operations	208			
FD-16	Special Protection Required	194			
FD-17	Miscellaneous Factors and Conditions	185			
FD-18	Pre-Incident Planning	77			
FD-19	Administration	190			
Weight in Grading	40			Credit Received	26.43
Relative Classification					
4					



Figure 7 Fire Department Grading Items Overall Summary



Fire Station 16 was assigned a Relative Class of 4. The figure above shows each grading item of the fire department and how much credit was received and how much credit is still available within each grading item. The relative classification contributes to the overall Public Fire Protection Classification (PFPC) of Fire District 16 and that of the entire Halifax Regional Municipality. Factoring in the Water Supply, Fire Safety Control and Emergency Communications grading items, Fire Station 16 was assigned an overall Public Fire Protection Classification of 4. This indicates that the level of response is proportionate to the level of risk in the fire protection district. To maintain the firefighting capabilities and the credit received for fire insurance grading purposes, it is recommended that a minimum of four career fire fighters be maintained at Station 16.

Maintaining the Public Fire Protection Classification for Station 16 will ensure residents within the fire protection area receive the full benefit of available property insurance premium discounts based on the level of fire protection provided. In the event the Station 16 is downgraded from a PFPC 4 to PFPC 5 the resulting cost to the tax payer in the form of insurance premiums is approximately \$500,000.00 in insurance premium increases for the zone. These values are estimates only as insurance rates are dynamic and dependent on a large number of factors. A further point to consider is that as the PFPC



decreases in value, i.e. going from PFPC 5 to PFPC 4 the capacity of an insurer to underwrite in the City may change and in turn create competition which may lower rates. It is difficult to quantify the true effects and figures given here are estimates.

Table 8 Premium Estimates under the Public Fire Protection Classification System – Response Zone 16

Public Fire Protection Classification	Total Premium Estimates Prior to FUS Study	Total Premium Estimates Post FUS Study	Total Premium Estimates Difference
3	\$919,671		
4		\$993,245	\$73,573
5		\$1,517,457	\$524,212

Recommendations

- Maintain four career fire fighters at Station 16.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 17
1150 Cole Harbour Road



Station 17 is located at 1150 Cole Harbour Road in the boundaries of Dartmouth, Nova Scotia in the Cole Harbour region. The station is located in a fairly central position for response to its overall coverage area. Figure 1 shows the 2,5 km, 5 km and 8 km coverage from Station 17.

Building and Tarmac

All fire stations should be of substantial construction, suitable for the service, and located and arranged for ease and quickness of response. The building is constructed of concrete block with brick veneer and the roof construction is of a metal flat truss and built up bitumen coating on a rigid insulation.

The tarmac outside the station is an asphalt covered area which extends from the bay door to the street and covers a small public parking area extending across the bay door area. The paved area extends around the building to the rear bay doors. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.



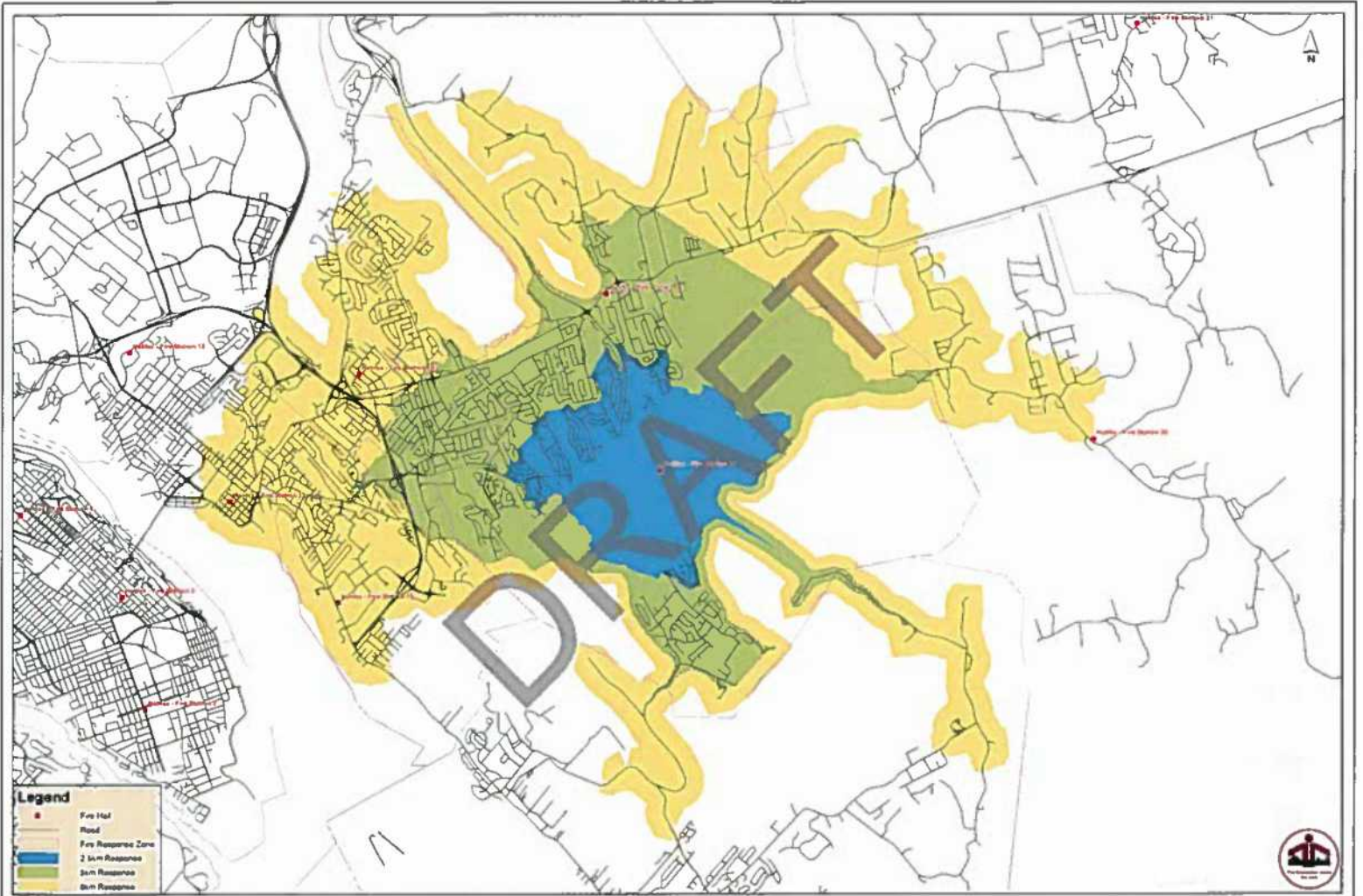


Figure 1 - 2.5/5km Response from Fire Station 17

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The Station has a number of crew facilities including sleeping quarters on the second level, a kitchen, dining area, washroom, exercise room, locker room and a day room on the main level. The sleeping quarters currently accommodate five staff members with separate quarters for Officers. There is a washroom and shower located across from the sleeping quarters. Apparatus bays are located in the same building. Station 17 has a separate office for its volunteer component. [REDACTED]

[REDACTED] The first floor serves as a hall and assembly area. It is open for public use and has a basic kitchen and washroom facilities. This area could be utilized as a basic place of refuge for the community in the event of a major emergency. The hall would however require some changes to meet emergency needs in a major incident. Overall the station facilities were found to be good condition. However the station requires cleaning in areas such as the volunteer office [REDACTED]

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

Community Risk Profile – Response Zone 17

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 8,542 Required Fire Flows were calculated for Response Zone 17 as shown in Figure 2 below.



Table 1 Required Fire Flow ranges in Response Zone 17

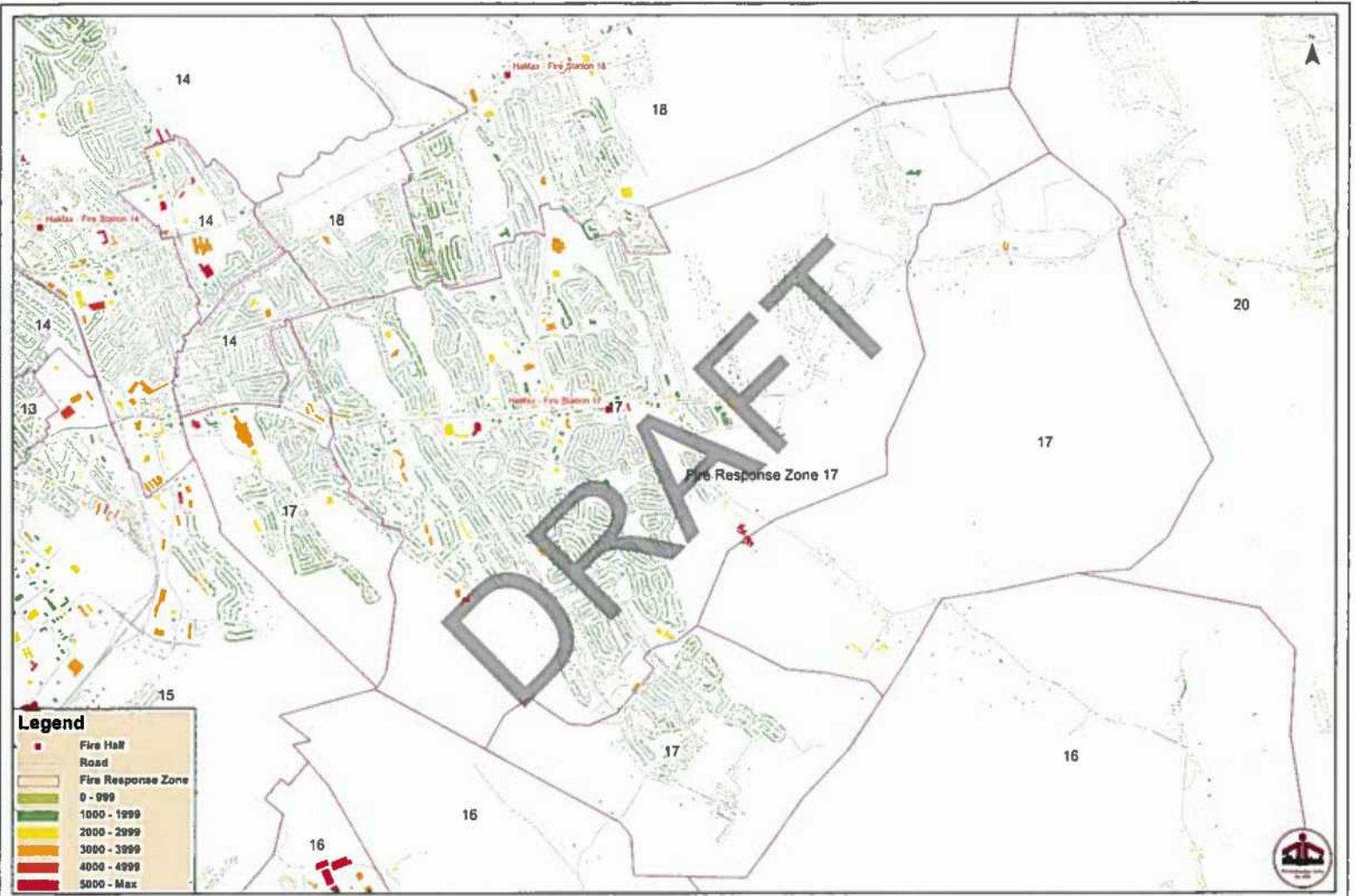
RFF Range	No. of RFF points
0-999 IGPM	1,050
1,000-1,999 IGPM	7,364
2,000-2,999 IGPM	101
3,000-3,999 IGPM	21
4,000-4,999 IGPM	3
>=5,000 IGPM	3

In addition the Basic Fire Flow was determined for the response area. The Basic Fire Flow is usually calculated as the 95th percentile RFF value or the 5th highest in the Fire Response Area. Considerations are given to the exposure risk, quantity of risks, and type of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response Zone 17 is based on the 5th highest which is 4,300 Imperial Gallons per Minute.

Table 2 Basic Fire Flows for HRM Response Zone 17

Total RFF Points	8,542	
	IGPM	L/s
90th Percentile	1,400	106.12
95th Percentile	1,500	113.70
Max	5,800	439.64
5th highest	4,300	325.94





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Apparatus & Personnel

Standard staffing for Station 17 is a 3 person 24/7 shift and a complement of 28 volunteers. Apparatus assignment for Station 17 is two Engines and one Pumper/Tanker. Station 17 was evaluated for the number of Engine and Ladder companies in service relative to the overall fire potential and the area being protected. Apparatus are required to be adequately housed and staffed. Fire apparatus that serve dual purposes are evaluated based on the primary duty it serves on the fire ground. The Total Credited Engine Companies is calculated [REDACTED]

[REDACTED] The credit may be downgraded from 100 percent based on reliability factors such as age, quality, listing, pump test results and distance. Based on the Basic Fire Flow of 4,300 IGPM, the apparatus requirements for Fire Station 17 as defined in the Fire Underwriters Survey - Table of Effective Response is as follows:

- First due Pumper Company in 3.5 minutes.
- Second due Pumper Company in 5 minutes.
- First due Ladder Company in 4 minutes.

The benchmark number of apparatus required is 5 Pumper companies in 7 minutes. These requirements reflect the apparatus need to attain maximum credit in the Engine and Ladder items of the fire department grading and serve as a benchmark against which response is measured. Ladders received 50 percent credit as Engine apparatus and 100 percent credit as Ladder apparatus. Fire Station 17 received credit for 6 Engines out of the maximum 5 Engine companies that can be credited for grading.

Table 3 Credited in Service Engine Summary

Station #	Vehicle Type	Apparatus Credit	Engine Credit	Reserve Engine Credit
17	Engine	100% Engine Credit	1	0
17	Pumper/Tanker	100% Engine Credit	1	0
17	Engine	100% Engine Credit	1	0
18	Engine	100% Engine Credit	1	0
18	Pumper/Tanker	100% Engine Credit	1	0
14	Engine	100% Engine Credit	1	0
Total Engine Credit:			6	1
Maximum Credit Receivable (4,300 Igpm):			5	1



Response areas with five buildings that are 3 storeys or 10 m (35 ft) or more in height, or districts that have a Basic Fire Flow greater than 3,300 IGPM, or any combination of these criteria, should have a Ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed Ladder companies for fire insurance grading to receive maximum credit. There are multiple buildings within the HRM Response Zone 17 that are three storeys or more in height. In addition several of the calculated Required Fire Flows were greater than 3,300 IGPM. Currently there is no ladder stationed at Station 17. Station 17 did not receive Ladder credit as the responding Ladders are beyond first due distance from Station 17.

Staffing at Station 17 was evaluated in its ability to meet the staffing requirements as determined by the Basic Fire Flow benchmark from the Table of Effective Response. The total available fire force grading item is weighted heavily within the fire insurance grading of the fire department. The staffing was measured against the FUS benchmark of at least six competent career fire fighters available and assigned to respond to fire for duty with each required Engine and Ladder Company. The number of first due (initial response) engine companies and ladder companies based on the benchmark Basic Fire Flow of 4,300 IGPM is two Engine companies and one Ladder. The maximum credit that Station 17 can receive for initial available fire force response is 18 fire fighters. NFPA 1710 requires each fire apparatus to be staffed with a minimum of four personnel. The current initial response from Station 17 is three fire fighters. The station was therefore credited with three fire fighters available for initial response out of the maximum 12 fire fighters that can be credited.

consideration should be given to reducing the number of volunteers to 15.

Station Location

Station 17 is well located for response. Figure 1 identifies the 2.5 km, 5 km and 8 km coverage areas for Station 17. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.



Fire calls

The historical calls for Station 17 cover a large area of the HRM. Figure 3 shows the response of Station 17 based on its historical calls for the years 2010 to September 2013. Station 17 responded to an average of 381 calls per year in the 45 months reviewed. The following table is a breakdown of the calls from 2010 to September 2013. The calls per year numbers for 2013 reflect the first 9 months of 2013.

Table 4 Total Emergency calls per year

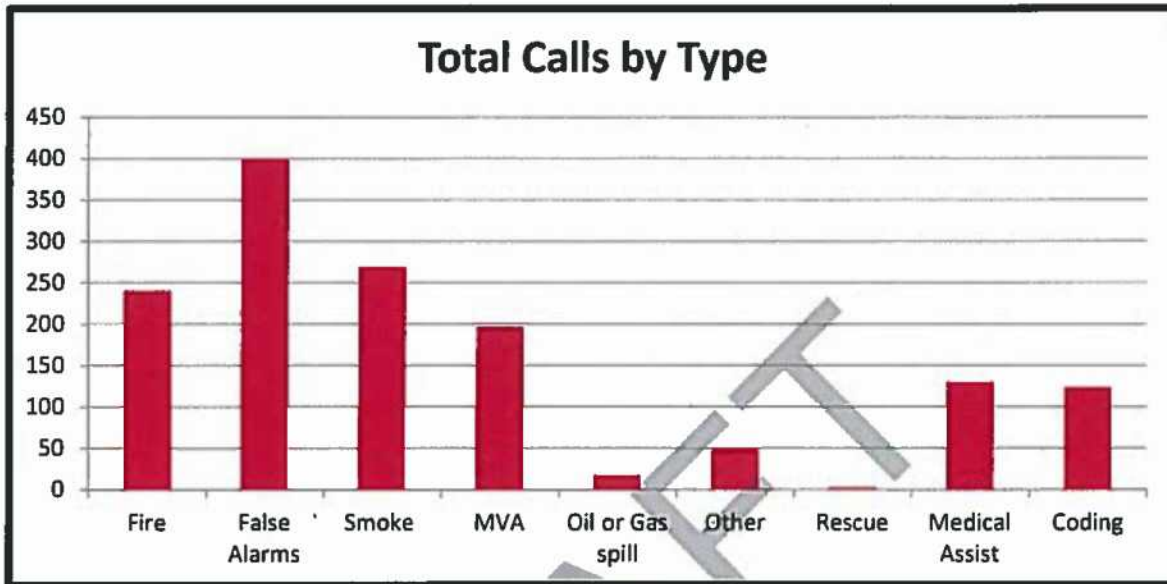
Total Calls per Year 2010 - 2013	
Year	No. of Calls
2010	436
2011	330
2012	414
2013	250

Table 5 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year Average	Percentage (%)
Fire	241	64	16.85
False alarm	400	107	27.97
Smoke	269	72	18.81
Motor Vehicle Accident	197	53	13.78
Oil or Gas spill	18	5	1.26
Other	48	13	3.36
Rescue	3	1	0.21
Medical Assist	130	35	9.09
Coding	124	33	8.67



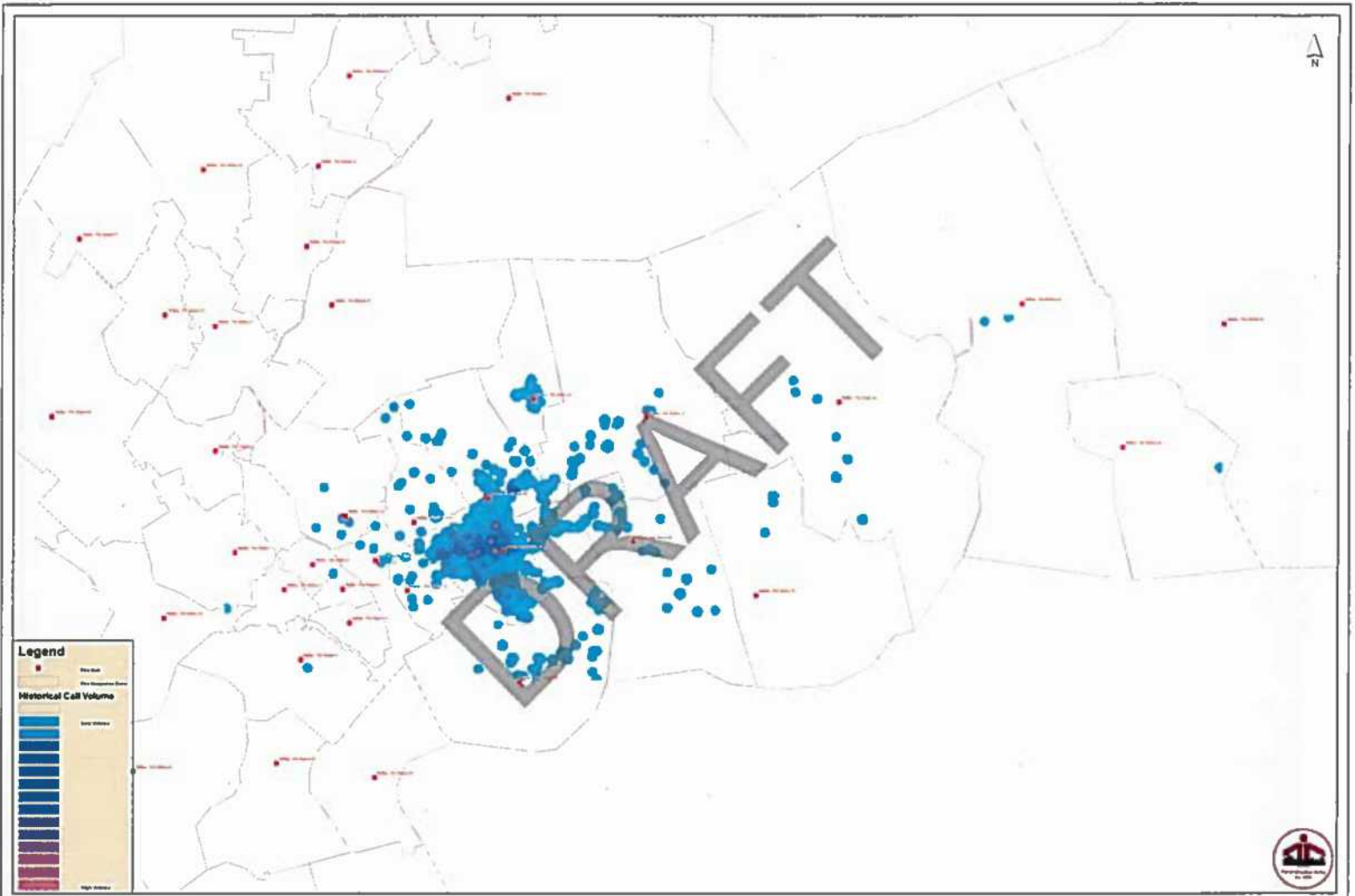
Figure 3 Emergency Calls by Incident Type (2010-2013)



The largest percentage of calls to Station 17 was False alarm calls. Currently there is a fine applied to false alarms but it was found to be minimal. The resulting cost of time, apparatus and personnel responding to a fire alarm should be considered when determining applicable fines. The fines should be increased so as to deter false alarms and encourage building owners to maintain and repair fire alarm systems rather than pay a fine for a false alarm. For motor vehicle accidents, the fire department should submit their invoice for services provided as a result of an accident involving a motor vehicle or for a loss to a motor vehicle (i.e. fire) to the Province.

In reviewing the emergency call data it was noted that improvements need to be made in the call reporting procedure. HRM should implement a standard around the time stamping of fire calls and review each month for conformance with the standard and conformance with the "Service Delivery Standards for Halifax Regional Fire and Emergency" for all portions of the call listed in the service delivery standard.





Legend

Fire Station

Historical Call Volume

Low Volume

High Volume

Figure 4 Historical Call Map - Fire Station 17

Scale = 1:60,000

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Within the HRM Relative Classifications for Emergency Communications, Fire Prevention and Safety Control were determined and applied as a single grade across the entire city.

Relative Classifications for Fire Department and Water Supplies were calculated specifically for individual areas as follows:

- Relative Classification for each Fire District i.e. the primary geographic response zone for each fire station (52 stations in 2013).
- Relative Classification for each Major Pressure Zone (SCADA zone) (3 distribution areas in 2013).

The Fire Department Assessment contributes 40 percent to the total Public Fire Protection Classification grade. This is the most heavily weighted portion of the grading and as such is considered to be the most significant indicator of a community or municipality's overall preparedness for dealing with fire emergencies.

[REDACTED]

This forms the basis of the relative classification of the Fire Department.



Figure 5 Fire Department Item Weights

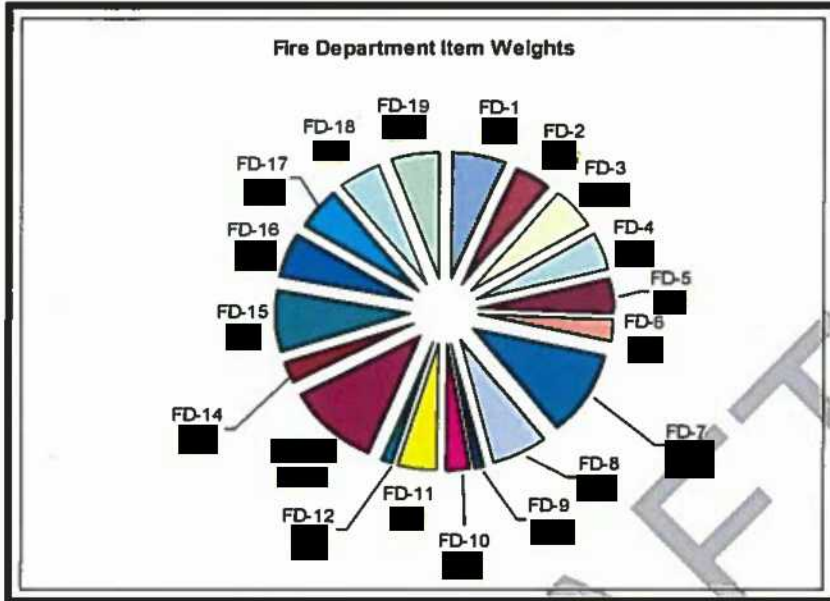


Figure 6 Fire Department Credit Points

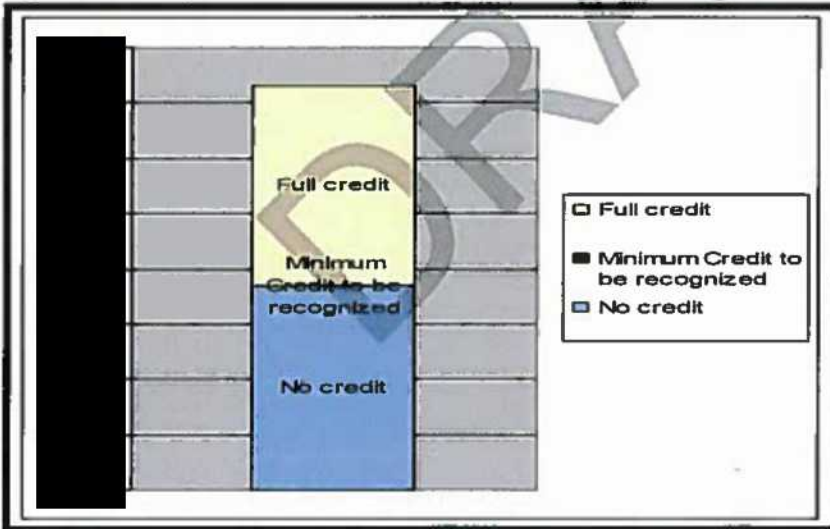
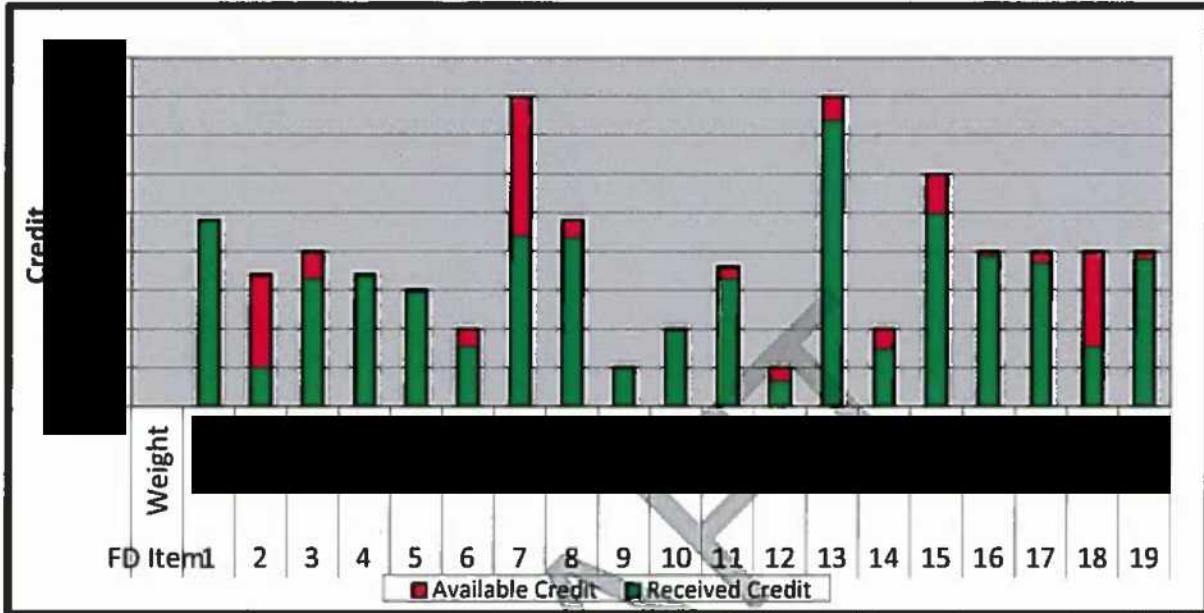


Table 6 Fire Department Grading Items Overall Summary

Grading Item	Category	Credit Received	Maximum Credit	% of FD	% of All
FD-1	Engine Service	240			
FD-2	Ladder Truck Service	50			
FD-3	Distribution of Companies and Type of Apparatus	165			
FD-4	Engine and Ladder Pump Capacity	170			
FD-5	Design, Maintenance and Condition of Apparatus	148			
FD-6	Number of Line Officers – Fire Suppression	78			
FD-7	Total Fire Force Available	220			
FD-8	Engine and Ladder Company Unit Manning	218			
FD-9	Master and Special Stream Devices	50			
FD-10	Equipment for Engines and Ladder Trucks, General	98			
FD-11	Fire Hose	165			
FD-12	Condition of Fire Hose	33			
FD-13	Training and Qualifications	369			
FD-14	Response to Alarms	74			
FD-15	Fire Ground Operations	249			
FD-16	Special Protection Required	194			
FD-17	Miscellaneous Factors and Conditions	185			
FD-18	Pre-Incident Planning	77			
FD-19	Administration	190			
Weight in Grading	40			Credit Received	24.92
Relative Classification					
4					



Figure 7 Fire Department Grading Items Overall Summary



Fire Station 17 was assigned a Relative Class of 4. The figure above shows each grading item of the fire department and how much credit was received and how much credit is still available within each grading item. The relative classification contributes to the overall Public Fire Protection Classification (PFPC) of Fire District 17 and that of the entire Halifax Regional Municipality. Factoring in the Water Supply, Fire Safety Control and Emergency Communication grading items, Fire Station 17 was assigned an overall Public Fire Protection Classification of 4. This indicates that the level of response is proportionate to the level of risk in the fire protection district. To maintain the firefighting capabilities and the credit received for fire insurance grading purposes, it is recommended that a minimum of four career fire fighters be maintained at Station 17. Consideration should be given to reducing the number of volunteer fire fighters to 15. The volunteers should be designated as Halifax Regional Municipality Volunteers and should be able to respond anywhere in the municipality.

Maintaining the Public Fire Protection Classification for Station 17 will ensure residents within the fire protection area receive the full benefit of available property insurance premium discounts based on the level of fire protection provided. In the event the Station 17 is downgraded from a PFPC 4 to PFPC 5 the resulting cost to the tax payer in the form of insurance premiums is approximately \$1,200,000.00 in



insurance premium increases for the zone. These values are estimates only as insurance rates are dynamic and dependent on a large number of factors. A further point to consider is that as the PFPC decreases in value, i.e. going from PFPC 5 to PFPC 4 the capacity of an insurer to underwrite in the City can change and in turn can create competition which can lower rates. It is difficult to quantify the true effects and figures given here are estimates.

Table 7 Premium Estimates under the Public Fire Protection Classification System – Response Zone 17

Public Fire Protection Classification	Total Premium Estimates Prior to FUS Study	Total Premium Estimates Post FUS Study	Total Premium Estimates Difference
4	\$2,361,785	\$2,361,785	
5		\$3,608,283	\$1,246,498

Recommendations

- Maintain four career fire fighters at Station 17. Consider reducing the number of volunteer fire fighters to 15.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 18
690 Highway 7



Station 18 is located at 690 Highway 7 in the Cole Harbour region. The station is located in a fairly central position for response to its overall coverage area. Figure 1 shows the 2.5 km, 5 km and 8 km coverage from Station 18.

Building and Tarmac

All fire stations should be of substantial construction, suitable for the service, and located and arranged for ease and quickness of response. The building is constructed of concrete block with brick veneer and the roof construction is of a metal flat truss and built up bitumen coating on a rigid insulation.

The tarmac outside the station is a concrete covered area which extends from the bay door to the street. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.



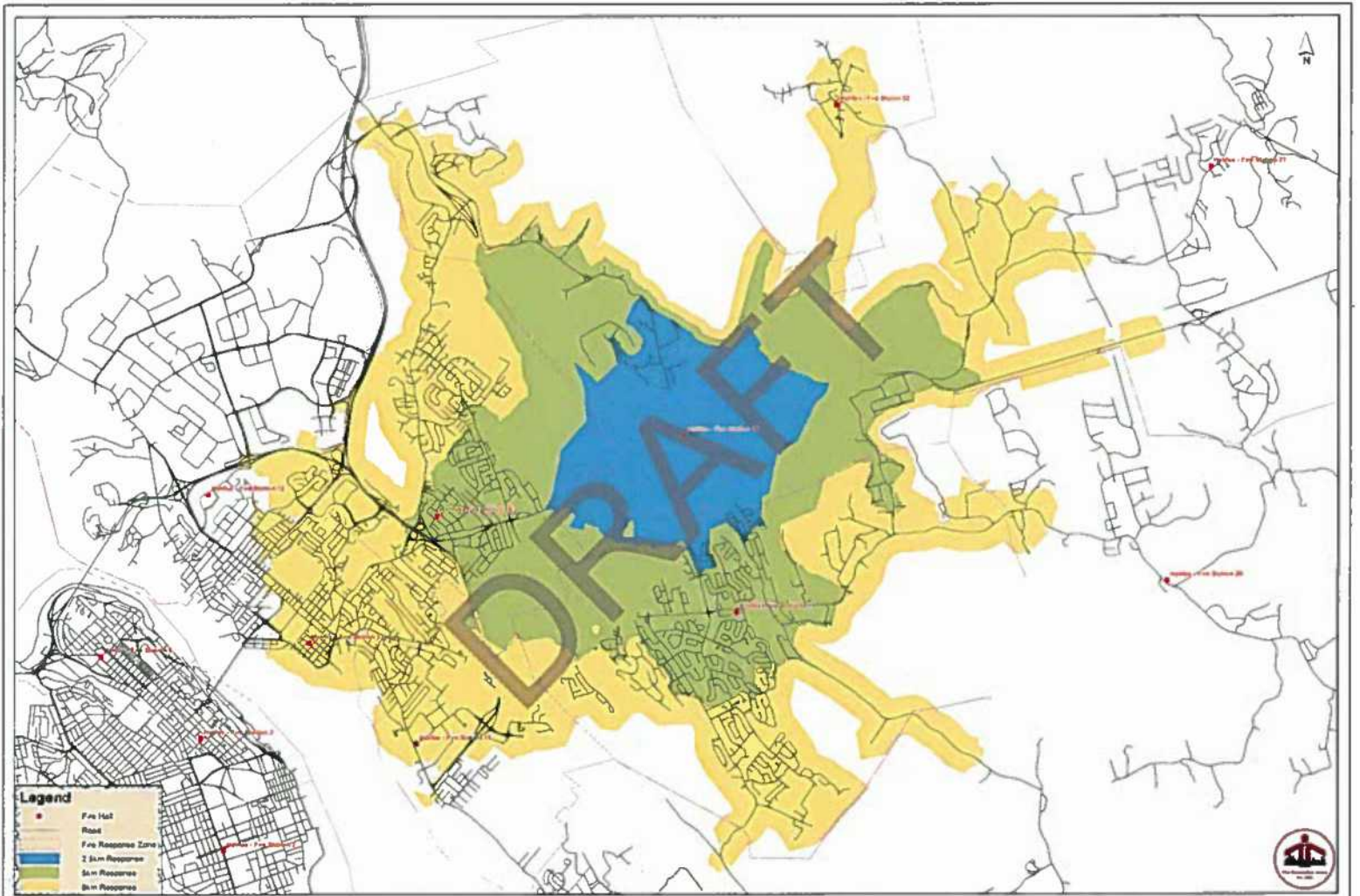


Figure 1 2.5/3km Response from Fire Station 18

Scale = 1:10,000

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The station has several crew facilities including sleeping quarters on the second level, a kitchen, dining area, washroom, exercise room, locker room and a day room on the main level. The sleeping quarters currently accommodate five staff members with separate quarters for Officers. There is a washroom and shower located across from the sleeping quarters. Apparatus bays are located in the same building.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

Community Risk Profile – Response Zone 18

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 4,650 Required Fire Flows were calculated for Response Zone 18 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 18

RFF Range	No. of RFF points
0-999 IGPM	942
1,000-1,999 IGPM	3,685
2,000-2,999 IGPM	18
3,000-3,999 IGPM	5
4,000-4,999 IGPM	0
>=5,000 IGPM	0



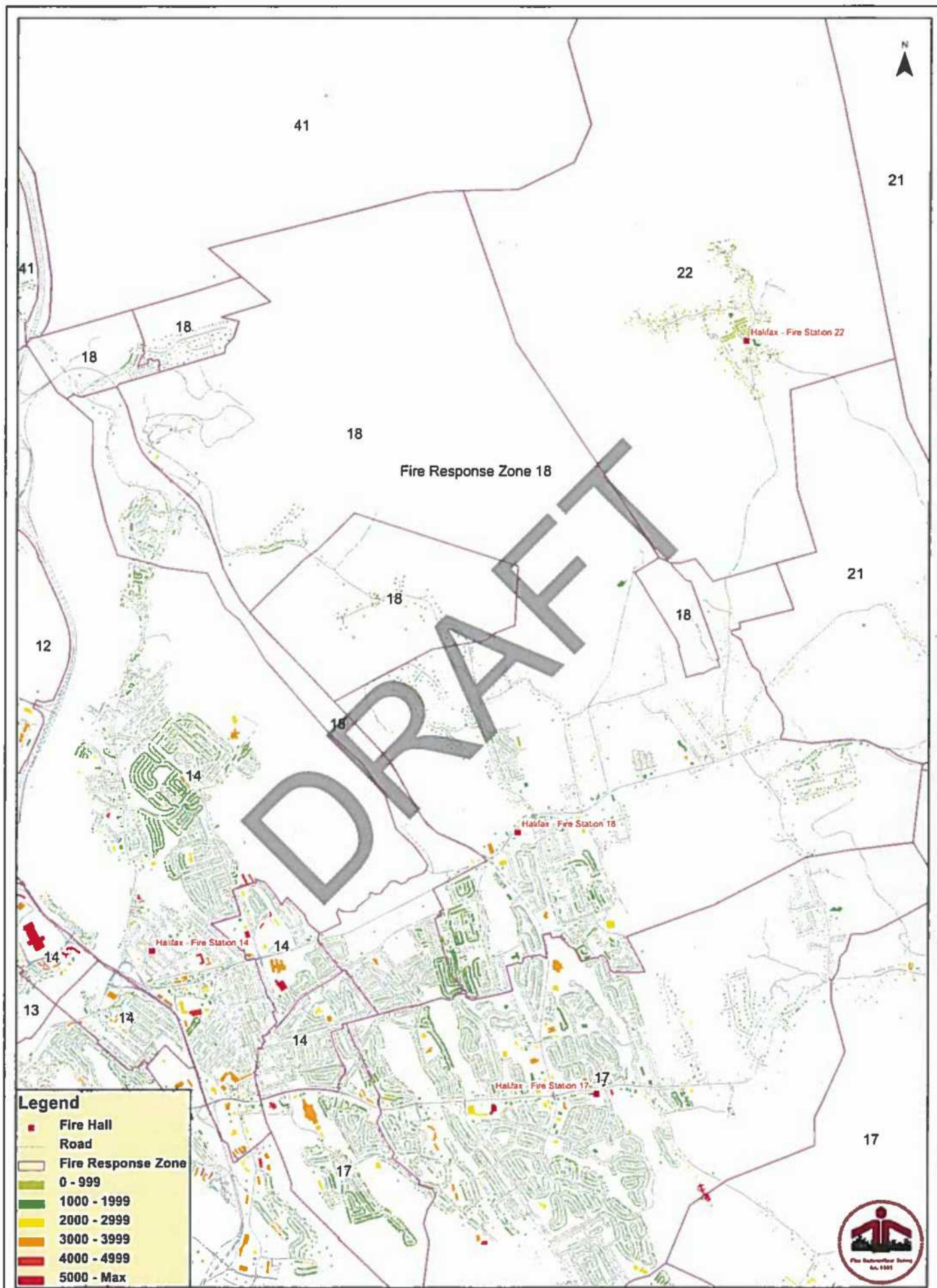
In addition the Basic Fire Flow was determined for the response area. The Basic Fire Flow is usually calculated as the 95th percentile RFF value or the 5th highest in the Fire Response Area. Considerations are given to the exposure risk, quantity of risks, and type of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response Zone 18 is based on the 95th percentile which is 1,400 Imperial Gallons per Minute.

Table 2 Basic Fire Flows for HRM Response Zone 18

Total RFF Points	4,650	
	IGPM	L/s
90th Percentile	1,400	106.12
95th Percentile	1,400	106.12
Max	3,600	272.88
5th highest	3,100	234.98

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Apparatus & Personnel

Standard staffing for Station 18 is a 4 person 24/7 shift and a complement of 28 volunteers. Apparatus assignment for Station 18 is two Engines and one Pumper/Tanker. Station 18 was evaluated for the number of Engine and Ladder companies in service relative to the overall fire potential and the area being protected. Apparatus are required to be adequately housed and staffed. Fire apparatus that serve dual purposes are evaluated based on the primary duty it serves on the fire ground. The Total Credited Engine Companies is calculated by [REDACTED]

[REDACTED] The credit may be downgraded from 100 percent based on reliability factors such as age, quality, listing, pump test results and distance.

Based on the Basic Fire Flow of 1,400 IGPM, the apparatus requirements for Fire Station 18 as defined in the Fire Underwriters Survey - Table of Effective Response is as follows:

- First due Pumper Company in 3.5 minutes.
- Second due Pumper Company in 5 minutes.

The benchmark number of apparatus required is 2 Pumper companies in 5 minutes. These requirements reflect the apparatus need to attain maximum credit in the Engine and Ladder items of the fire department grading and serve as a benchmark against which response is measured. Ladders received 50 percent credit as Engine apparatus and 100 percent credit as Ladder apparatus. Fire Station 18 received credit for 2 Engines out of the maximum 2 Engine companies that can be credited for grading.

Table 3 Credited in Service Engine Summary

Station #	Vehicle Type	Apparatus Credit	Engine Credit	Reserve Engine Credit
18	Engine	100% Engine Credit	1	0
18	Pumper/Tanker	100% Engine Credit	1	0
	Engine	100% Reserve Credit	0	1
Total Engine Credit:			2	1
Maximum Credit Receivable (1,400 Igpm):			2	1

Response areas with five buildings that are 3 storeys or 10 m (35 ft) or more in height, or districts that have a Basic Fire Flow greater than 3,300 IGPM, or any combination of these criteria, should have a



Ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed Ladder companies for fire insurance grading to receive maximum credit. Currently there is no ladder stationed at Station 18. Based on the Basic Fire Flow and types of risks in the community, a Ladder is not required at Station 18.

Staffing at Station 18 was evaluated in its ability to meet the staffing requirements as determined by the Basic Fire Flow benchmark from the Table of Effective Response. The total available fire force grading item is weighted heavily within the fire insurance grading of the fire department. The staffing was measured against the FUS benchmark of at least six competent career fire fighters available and assigned to respond to fire for duty with each required Engine and Ladder Company. The number of first due (initial response) engine companies and ladder companies based on the benchmark Basic Fire Flow of 1,400 IGPM is two Engine companies. The maximum credit that Station 18 can receive for initial available fire force response is 12 fire fighters. NFPA 1710 requires each fire apparatus to be staffed with a minimum of four personnel. The current initial response from Station 18 is four fire fighters. The station was therefore credited with four fire fighters available for initial response out of the maximum 12 fire fighters that can be credited. There are currently 28 volunteers at Station 18 but as it is a composite station, they are not always actively involved in actual fires and as such consideration should be given to reducing the number of volunteers to 15.

Station Location

Station 18 is well located for response. Figure 1 identifies the 2.5 km, 5 km and 8 km coverage areas for Station 18. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.



Fire calls

The historical calls for Station 18 cover a large area of the HRM. Figure 3 shows the response of Station 18 based on its historical calls for the years 2010 to 2013. Station 18 responded to an average of 258 calls per year in the in the 45 months reviewed. Table 4 is a breakdown of the calls from 2010 to September 2013. The total for 2013 reflects the emergency calls for the first 9 months of the year. Table 5 shows the breakdown of emergency calls by incident type. The year average was calculated for all calls over the 45 months.

Table 4 Total Emergency calls per year

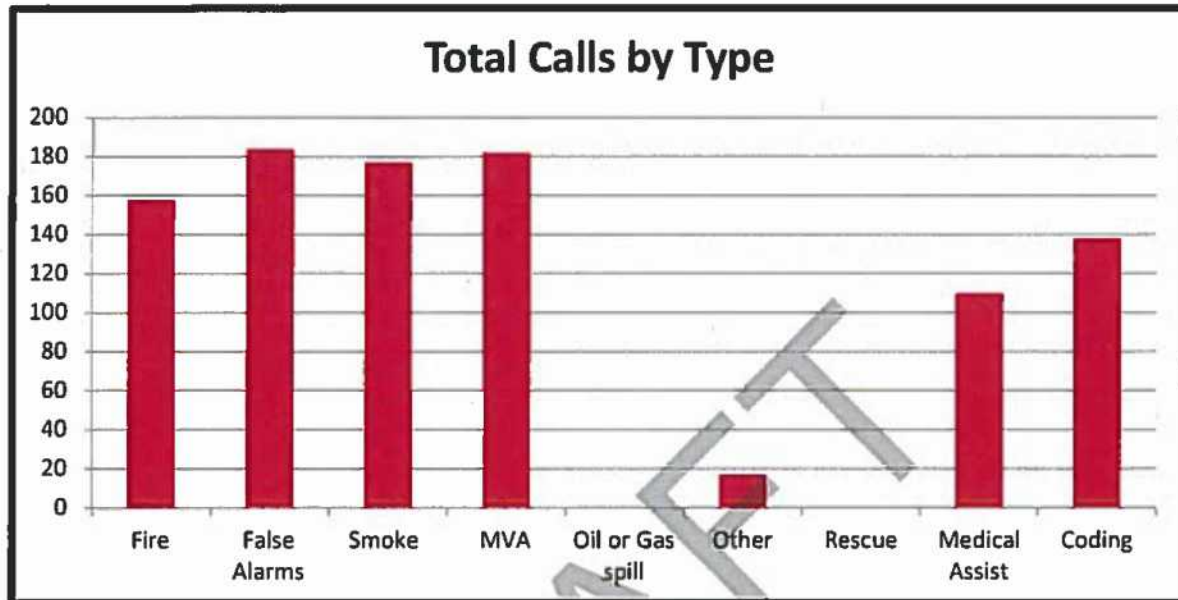
Total Calls per Year 2010 - 2013	
Year	No. of Calls
2010	255
2011	284
2012	261
2013	166

Table 5 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	158	42	16.4
False alarm	184	49	19.0
Smoke	177	47	18.3
Motor Vehicle Accident	182	48	18.8
Oil or Gas spill	0	0	0.0
Other	17	4.5	1.8
Rescue	0	0	0.0
Medical Assist	110	29	11.4
Coding	138	36	14.3



Figure 3 Emergency Calls by Incident Type (2010-2013)



The largest percentage of calls to Station 18 was False alarm calls and motor vehicle accidents (MVA). Currently there is a fine applied to false alarms but it was found to be minimal. The resulting cost of time, apparatus and personnel responding to a fire alarm should be considered when determining applicable fines. The fines should be increased so as to deter false alarms and encourage building owners to maintain and repair fire alarm systems rather than pay a fine for a false alarm. For motor vehicle accidents, the fire department should submit their invoice for services provided as a result of an accident involving a motor vehicle or for a loss to a motor vehicle (i.e. fire) to the Province.

In reviewing the emergency call data it was noted that improvements need to be made in the call reporting procedure. HRM should implement a standard around the time stamping of fire calls and review each month for conformance with the standard and conformance with the "Service Delivery Standards for Halifax Regional Fire and Emergency" for all portions of the call listed in the service delivery standard.



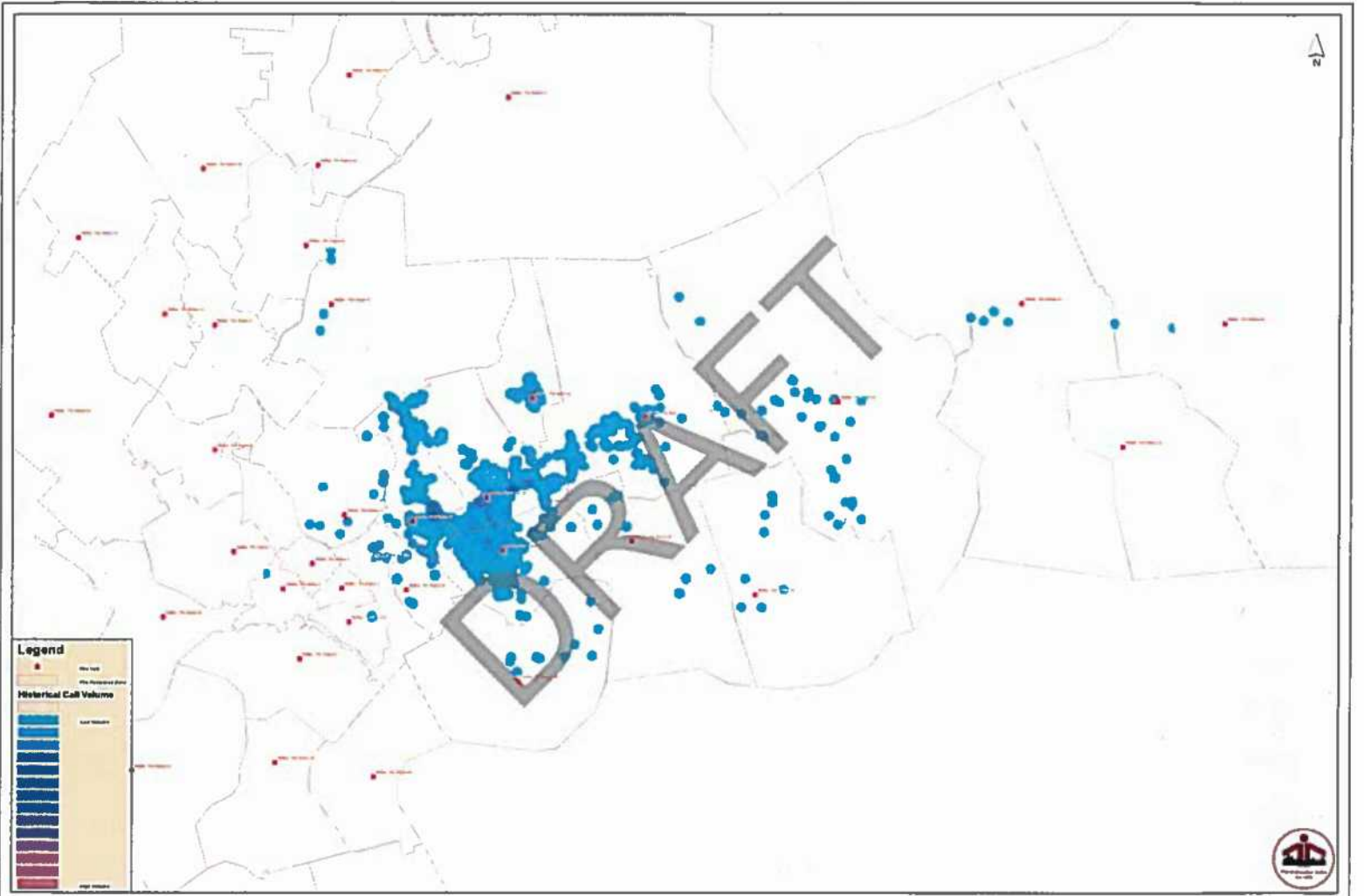


Figure 4 Historical Call Map - Fire Station 18

Scale = 1:60,000

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Within the HRM Relative Classifications for Emergency Communications, Fire Prevention and Safety Control were determined and applied as a single grade across the entire city.

Relative Classifications for Fire Department and Water Supplies were calculated specifically for individual areas as follows:

- Relative Classification for each Fire District i.e. the primary geographic response zone for each fire station (52 stations in 2013).
- Relative Classification for each Major Pressure Zone (SCADA zone) (3 distribution areas in 2013).

The Fire Department Assessment contributes 40 percent to the total Public Fire Protection Classification grade. This is the most heavily weighted portion of the grading and as such is considered to be the most significant indicator of a community or municipality's overall preparedness for dealing with fire emergencies.

[REDACTED] This forms the basis of the relative classification of the Fire Department.



Figure 5 Fire Department Item Weights

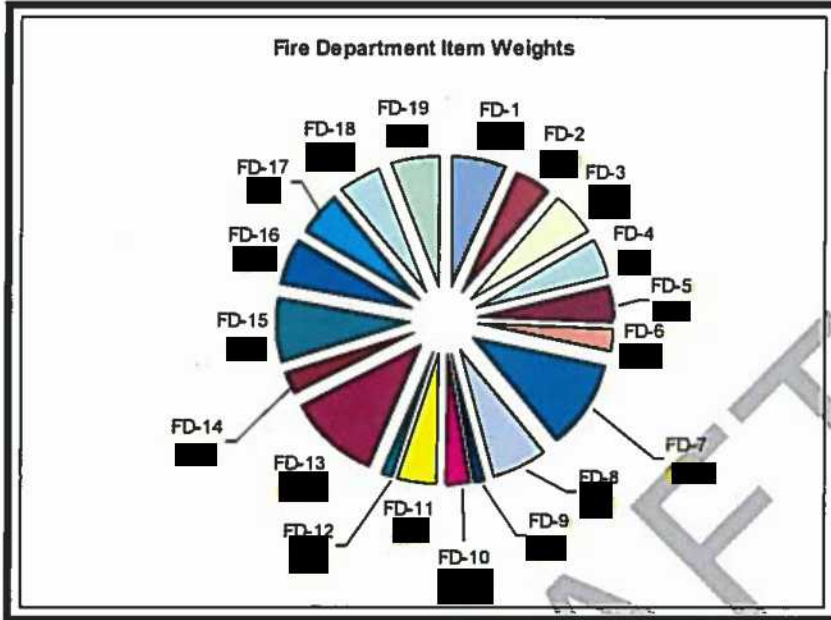


Figure 6 Fire Department Credit Points

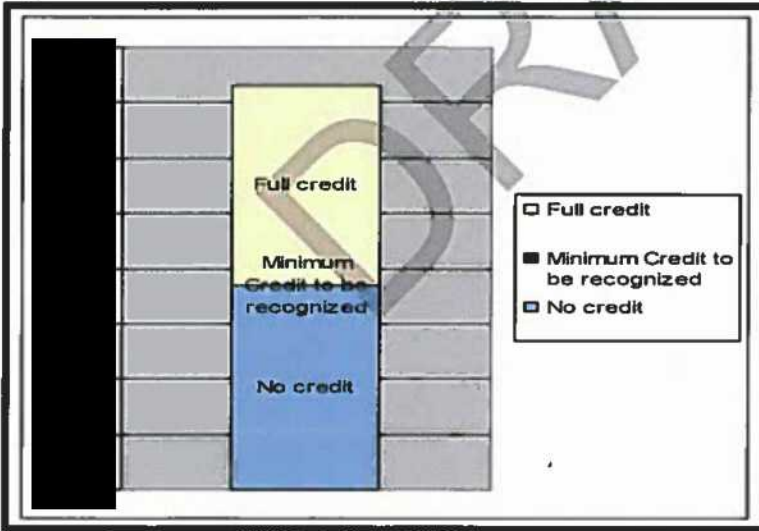
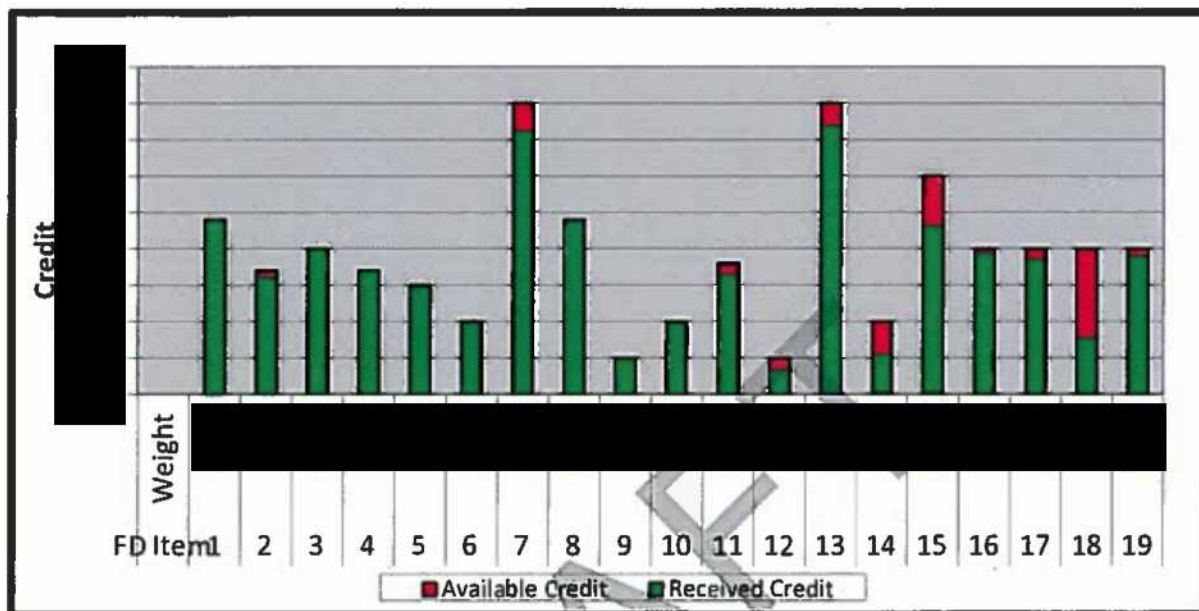


Table 6 Fire Department Grading Items Overall Summary

Grading Item	Category	Credit Received	Maximum Credit	% of FD	% of All
FD-1	Engine Service	240			
FD-2	Ladder Truck Service	161			
FD-3	Distribution of Companies and Type of Apparatus	200			
FD-4	Engine and Ladder Pump Capacity	170			
FD-5	Design, Maintenance and Condition of Apparatus	148			
FD-6	Number of Line Officers – Fire Suppression	100			
FD-7	Total Fire Force Available	362			
FD-8	Engine and Ladder Company Unit Manning	240			
FD-9	Master and Special Stream Devices	50			
FD-10	Equipment for Engines and Ladder Trucks, General	98			
FD-11	Fire Hose	165			
FD-12	Condition of Fire Hose	33			
FD-13	Training and Qualifications	369			
FD-14	Response to Alarms	55			
FD-15	Fire Ground Operations	231			
FD-16	Special Protection Required	194			
FD-17	Miscellaneous Factors and Conditions	185			
FD-18	Pre-Incident Planning	77			
FD-19	Administration	190			
Weight in Grading	40			Credit Received	31.50
Relative Classification					
4					



Figure 7 Fire Department Grading Items Overall Summary



Fire Station 18 was assigned a Relative Class of 3. The figure above shows each grading item of the fire department and how much credit was received and how much credit is still available within each grading item. The relative classification contributes to the overall Public Fire Protection Classification (PFPC) of Fire District 18 and that of the entire Halifax Regional Municipality. Factoring in the water supply, fire safety control and emergency grading items, Fire Station 18 was assigned an overall Public Fire Protection Classification of 4. This indicates that the level of response is proportionate to the level of risk in the fire protection district. To maintain the firefighting capabilities and the credit received for fire insurance grading purposes, it is recommended that a minimum of four career fire fighters be maintained at Station 18. Consideration should be given to reducing the number of volunteer fire fighters to 15. The volunteers should be designated as Halifax Regional Municipality Volunteers and should be able to respond anywhere in the municipality.

Maintaining the Public Fire Protection Classification for Station 18 will ensure residents within the fire protection area receive the full benefit of available property insurance premium discounts based on the level of fire protection provided. In the event the Station 18 is downgraded from a PFPC 4 to PFPC 5 the resulting cost to the tax payer in the form of insurance premiums is approximately \$600,000.00 in



insurance rate increases for the zone. These values are estimates only as insurance rates are dynamic and dependent on a large number of factors. A further point to consider is that as the PFPC decreases in value, i.e. going from PFPC 5 to PFPC 4 the capacity of an insurer to underwrite in the City can change and in turn can create competition which can lower rates. It is difficult to quantify the true effects and figures given here are estimates.

Table 7 Premium Estimates under the Public Fire Protection Classification System – Response Zone 18

Public Fire Protection Classification	Total Premium Estimates Prior to FUS Study	Total Premium Estimates Post FUS Study	Total Premium Estimates Difference
4	\$1,134,724	\$1,134,724	
5		\$1,733,606	\$598,882

Recommendations

- Maintain four career fire fighters at Station 18. Consider reducing the number of volunteer fire fighters to 15.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 19

2385 Crowell Rd, Lawrencetown Beach



Station 19 is located in the community of Lawrencetown Beach on Crowell Road. Station 19 provides response to communities in the Lawrencetown Beach Area of HRM and is located in the Eastern portion of its response zone. Figure 1 shows the current 2.5 km, 5 km and 8 km response coverage area for Station 19. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area (5 km coverage) represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area (8 km coverage) represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by 22 volunteers and houses a Tanker, Rescue vehicle and a Rescue boat with trailer.

Building and Tarmac

The station construction is metal clad, concrete block and masonry units with 4 bays. The station can adequately house the apparatus assigned to it.



The tarmac outside the station is an asphalt covered area which extends from the bay door outward. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

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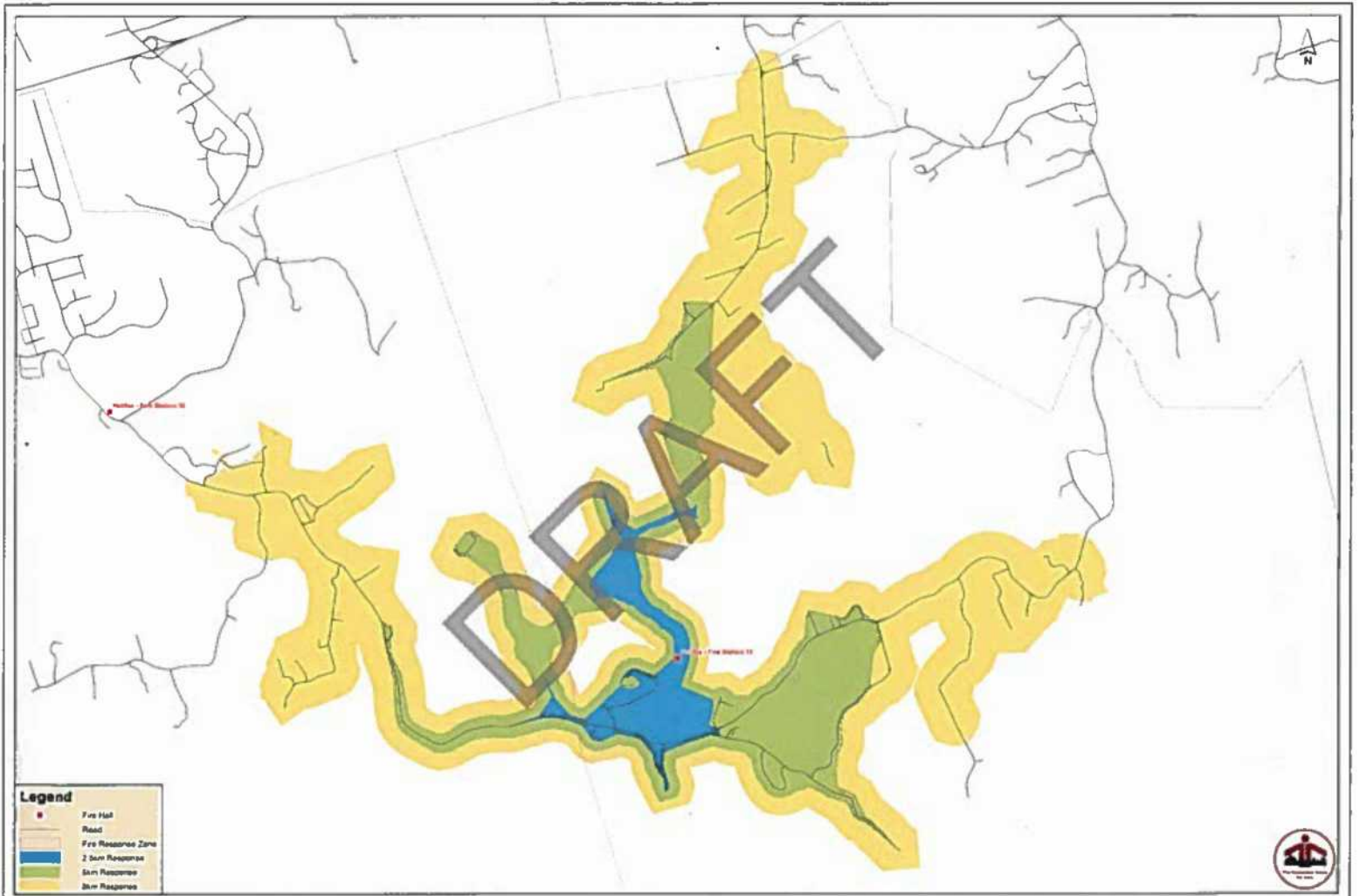


Figure 1 2.558km Response from Fire Station 18

Scale = 1:13,000

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities in Station 19 are adequate to meet the needs of the fire fighters.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

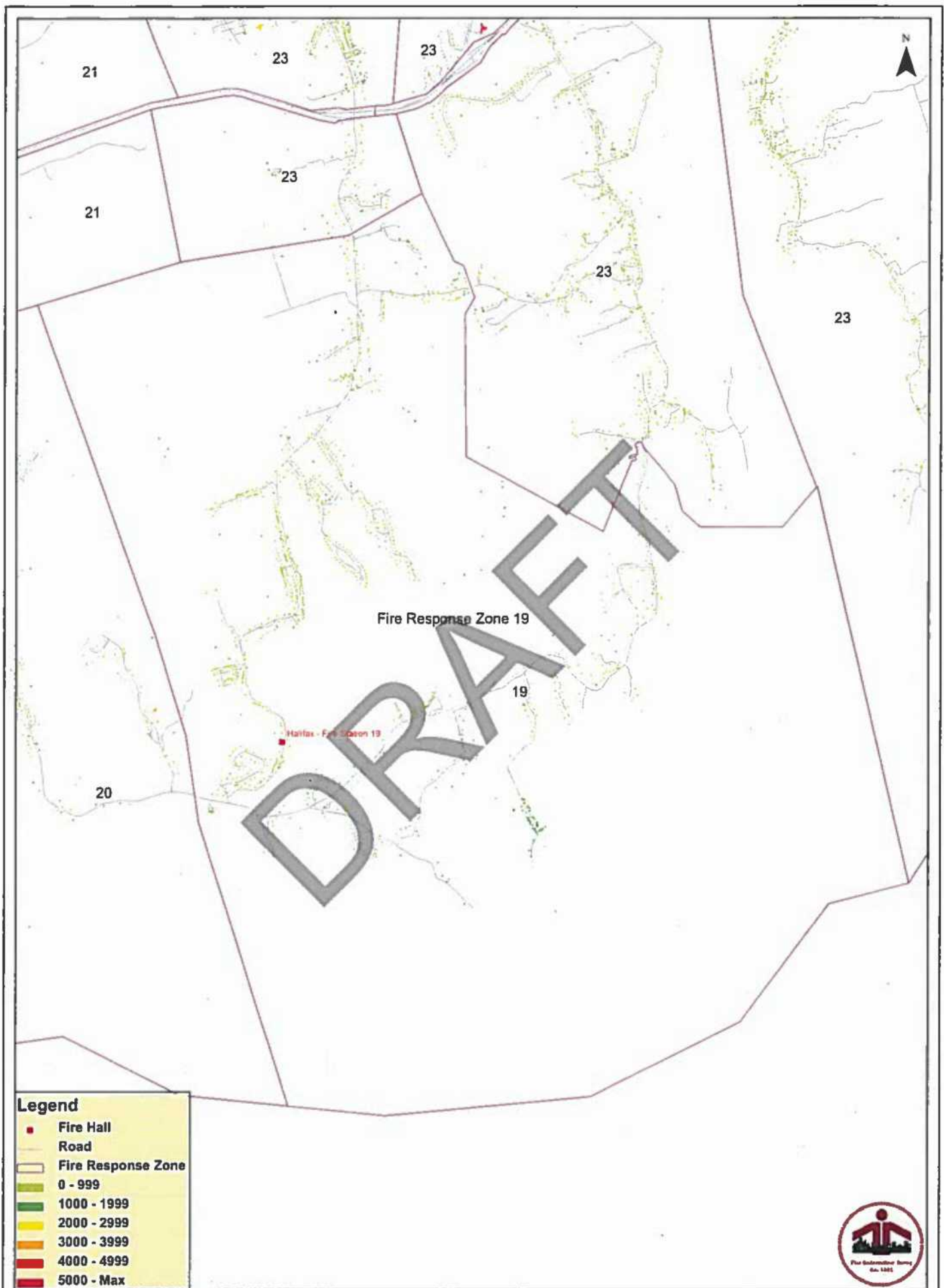
Community Risk Profile – Response Zone

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 1,147 Required Fire Flows were calculated for Response Zone 19 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 19

RFF Range	No. of RFF points
0-999 IGPM	768
1,000-1,999 IGPM	378
2,000-2,999 IGPM	1
3,000-3,999 IGPM	0
4,000-4,999 IGPM	0
>=5,000 IGPM	0





- Legend**
- Fire Hall
 - Road
 - Fire Response Zone
 - 0 - 999
 - 1000 - 1999
 - 2000 - 2999
 - 3000 - 3999
 - 4000 - 4999
 - 5000 - Max

Figure 2 Halifax Fire Response Zone 19 - Building Footprints with RFF Value

The Basic Fire Flows assigned for Station 19 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for response zone 19 is based on the 95th percentile which is 1,200 imperial gallons per minute.

Table 2 Basic Fire Flows for HRM Response Zone 19

Total RFF Points	1,147	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,200	90.96
Max	2,800	212.24
5th highest	1,600	121.28

Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 19 is one Engine apparatus. The current apparatus located at Station 19 is a Pumper/Tanker which is in good condition and is well equipped. Standard staffing for Station 19 is 22 volunteers, which allows the station to meet the minimum initial response of four to six fire fighters available to respond on first alarms.

Fire Calls

In the period from January 2010 until September 2013 Station 19 responded to a total of 241 emergency calls as shown in Table 3 and Figure 4 and 5 below. The year average was calculated for all calls over the 45 months reviewed. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls that could not be identified. The primary response for this station was Medical calls at 52 percent of the total call volume.



Table 3 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	38	10	15.77
False alarm	19	5	7.88
Smoke	8	2	3.32
Motor Vehicle Accident	14	4	5.81
Oil or Gas spill	0	0	0.00
Other	9	2	3.73
Rescue	2	1	0.83
Medical Assist	127	34	52.70
Coding	24	6	9.96

Figure 3 Emergency Calls by Incident Type (2010-2013)

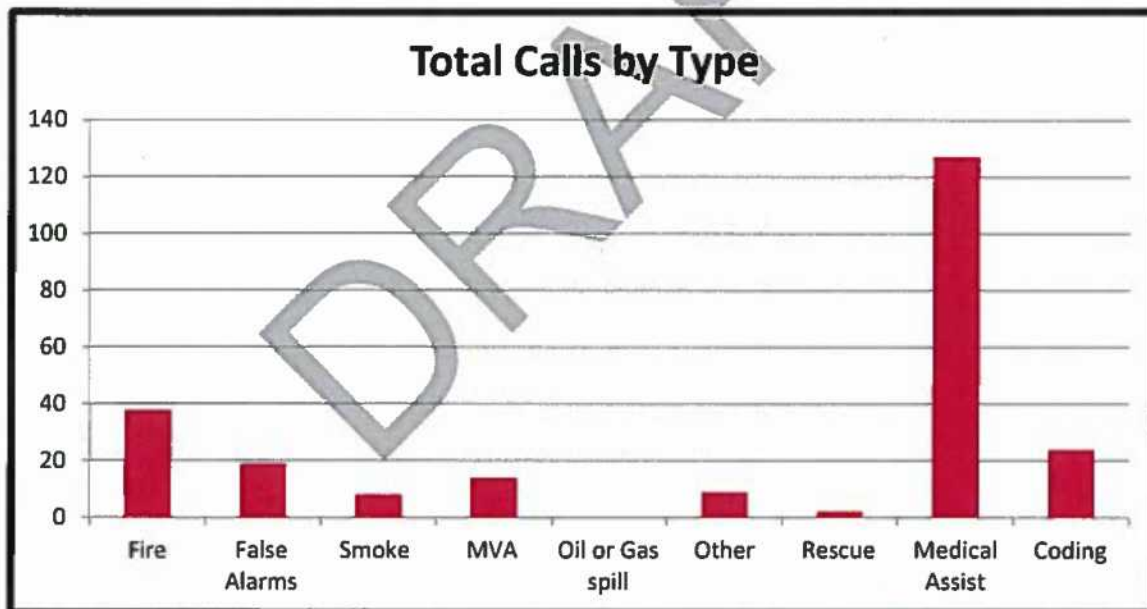


Figure 4 Percentage of Calls by Incident Type (2010-2013)

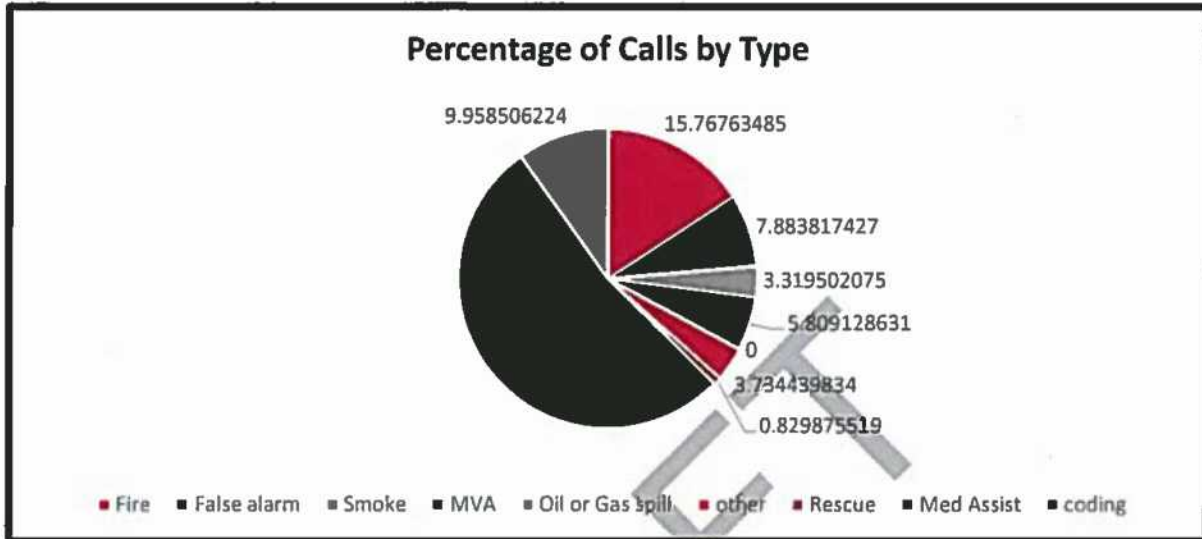


Table 4 is a breakdown of the fire calls by time of day for Station 19. The total number of calls in Table 4 does not include calls whereby the apparatus returned to the station or those for which the type of call could not be identified. The bulk of the calls are daytime and evening responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	39	16.7%
Daytime	0700 – 1659	99	42.5%
Evening	1700 – 2359	95	40.7%



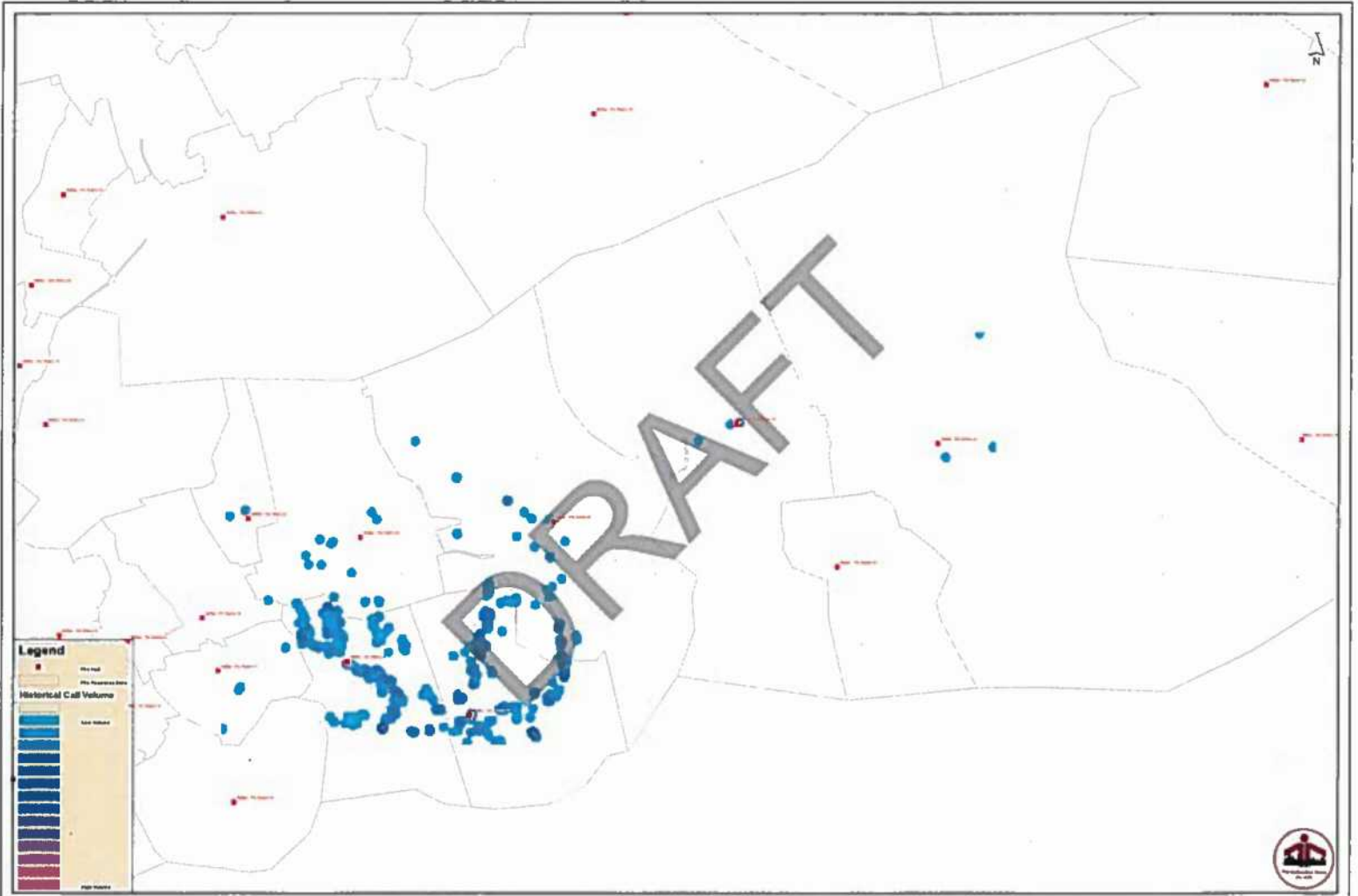


Figure 5 Historical Call Map - Fire Station 19

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 19 was assigned a Public Fire Protection Classification 8 and a Dwelling Protection Grade 3B.

Recommendations

- Station 19 should remain as an active volunteer station. Based on the number of calls and call types, the volunteer staffing is adequate for the level of risk and demand in the fire response zone.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 20

2931 Lawrencetown Rd, Lawrencetown



Station 20 is located in the community of Lawrencetown Beach on Lawrencetown Road. Station 20 provides response to communities in the Lawrencetown Community in the HRM. Figure 1 shows the current 2.5 km, 5 km and 8 km response coverage area for Station 20. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area (5 km coverage) represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area (8 km coverage) represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less. Beyond the 8 km, residential risks are considered unprotected for fire insurance grading purposes.

The station is staffed by 22 volunteer fire fighters, and houses a Rescue Engine, Tanker, Rescue vehicle, a Rescue boat and a Tow vehicle.

Building and Tarmac

The station construction is composed of wood frame, concrete block and masonry units. The building has three apparatus bays. The station can adequately house the apparatus assigned to it.

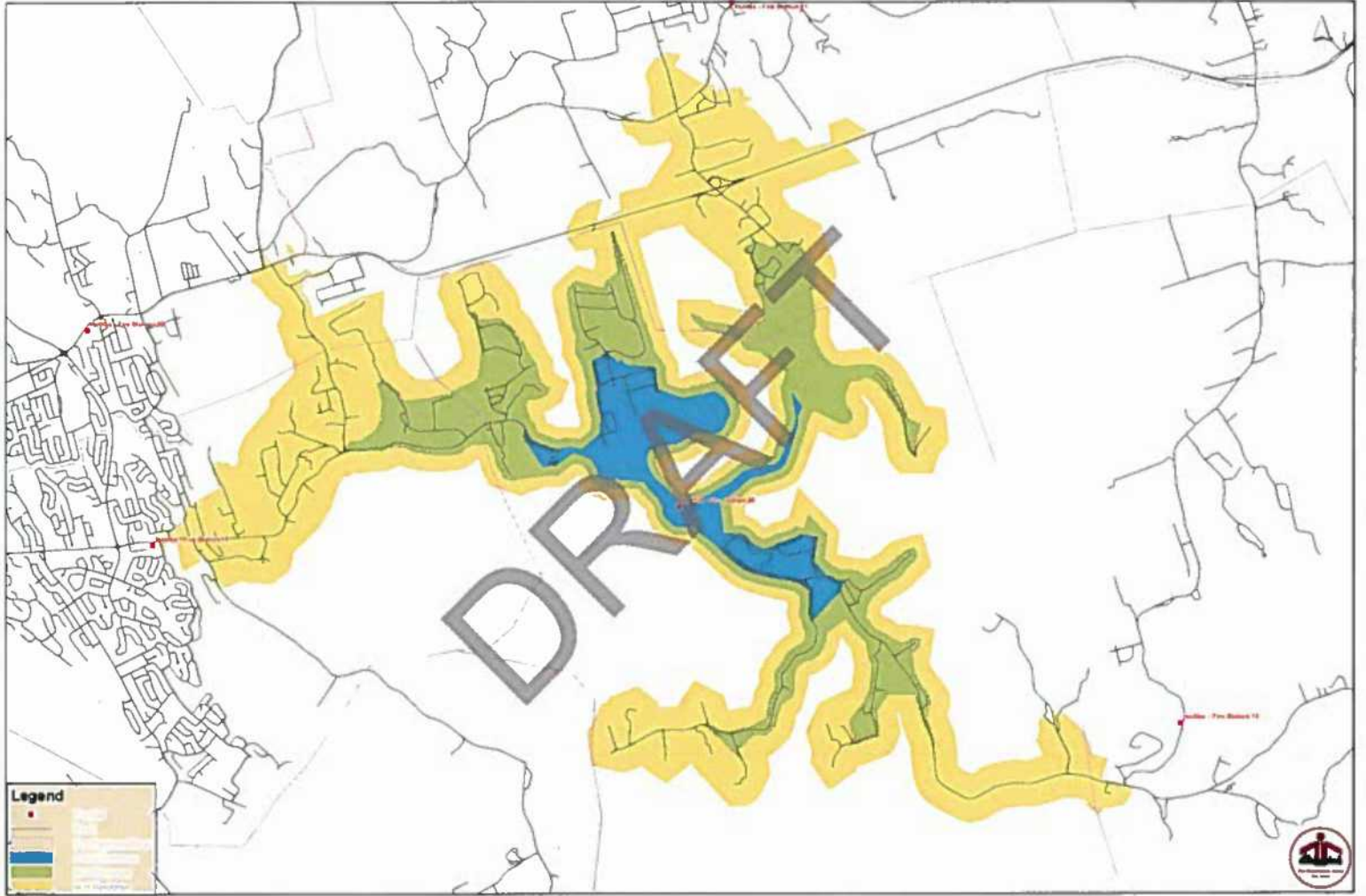
February 2015



The tarmac outside the station is an asphalt covered area which extends from the bay door outward. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

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Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities in Station 20 are adequate to meet the needs of the fire fighters.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

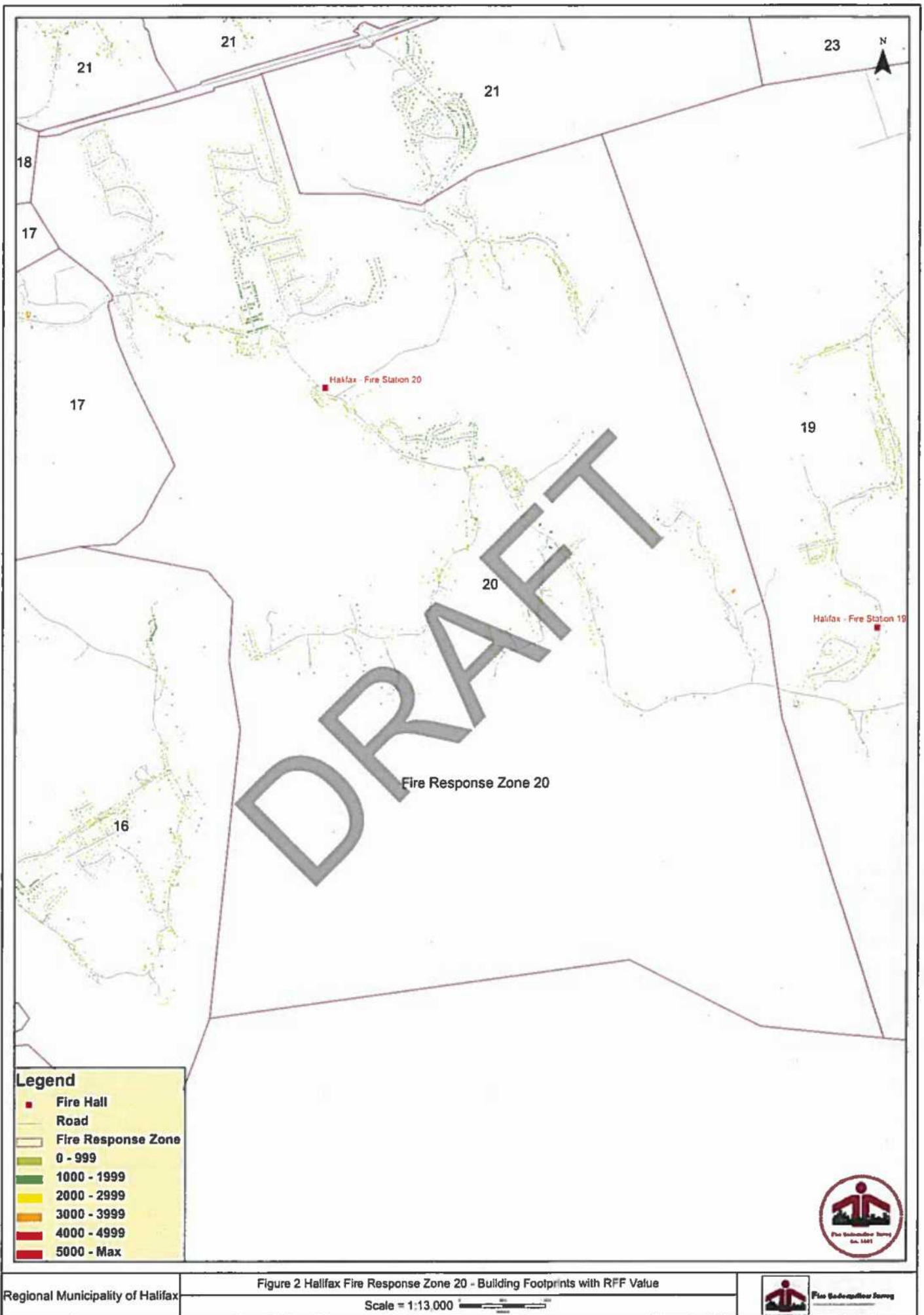
Community Risk Profile – Response Zone

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 1,664 Required Fire Flows were calculated for Response Zone 20 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 20

RFF Range	No. of RFF points
0-999 IGPM	873
1,000-1,999 IGPM	787
2,000-2,999 IGPM	2
3,000-3,999 IGPM	2
4,000-4,999 IGPM	0
>=5,000 IGPM	0





The Basic Fire Flows assigned for Station 20 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited to large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for response zone 20 is based on the 95th percentile which is 1,200 imperial gallons per minute.

Table 2 Basic Fire Flows for HRM Response Zone 20

Total RFF Points	1,664	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,200	90.96
Max	3,700	280.46
5th highest	1,900	144.02

Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 20 is one Engine apparatus. Station 20 houses one Engine which is well equipped and in good condition. Standard staffing for Station 20 is 22 volunteers, which allows the station to meet the minimum initial response of four to six fire fighters available to respond on first alarms.

Fire Calls

In the period from January 2010 until September 2013 Station 20 received 391 emergency calls with a breakdown as shown in Table 3 and Figure 3 and 4 below. The year average was calculated for all calls over the 45 months.

The primary response for this station has been Medical calls at 44.7% of the total call volume. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls could not be identified.



Table 3 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	58	15	14.83
False alarm	44	12	11.25
Smoke Invest	25	7	6.39
Motor Vehicle Accident	40	11	10.23
Oil or Gas spill	0	0	0.00
Other	7	2	1.79
Rescue	3	1	0.77
Medical Assist	175	47	44.76
Coding	39	10	9.97

Figure 3 Emergency Calls by Incident Type (2010-2013)

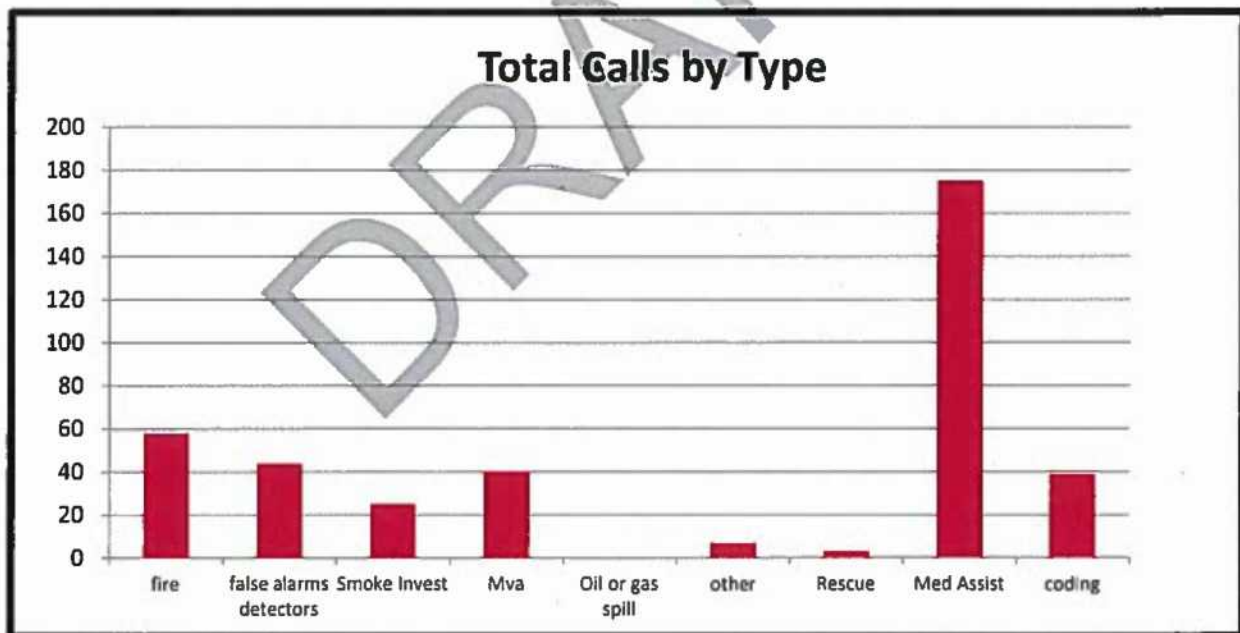
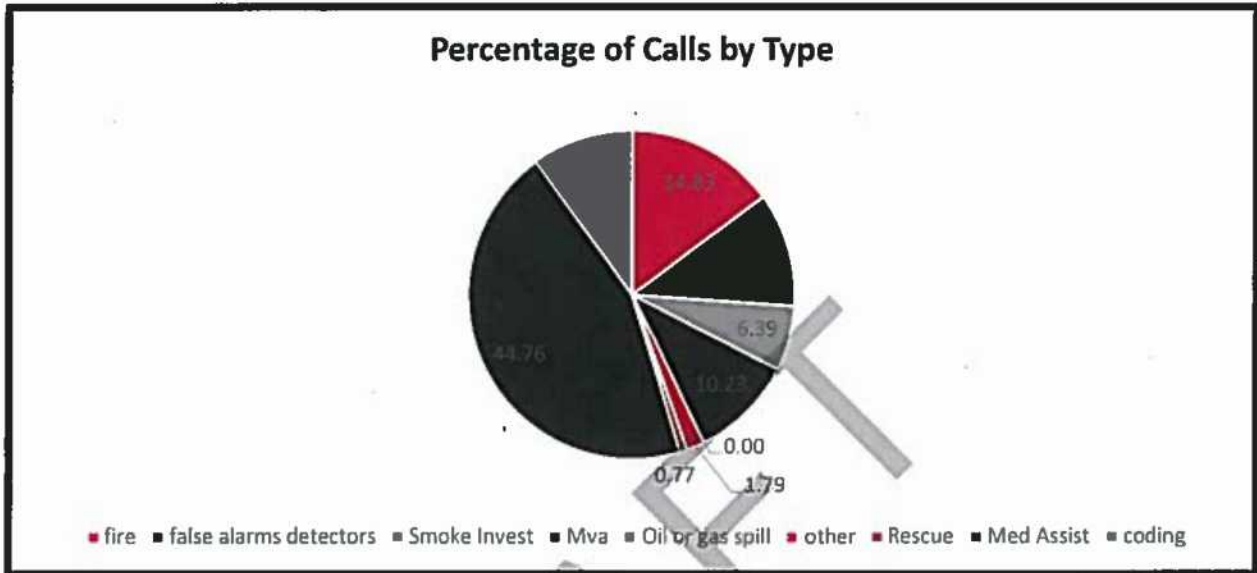


Figure 4 Percentage of Calls by Incident Type (2010-2013)



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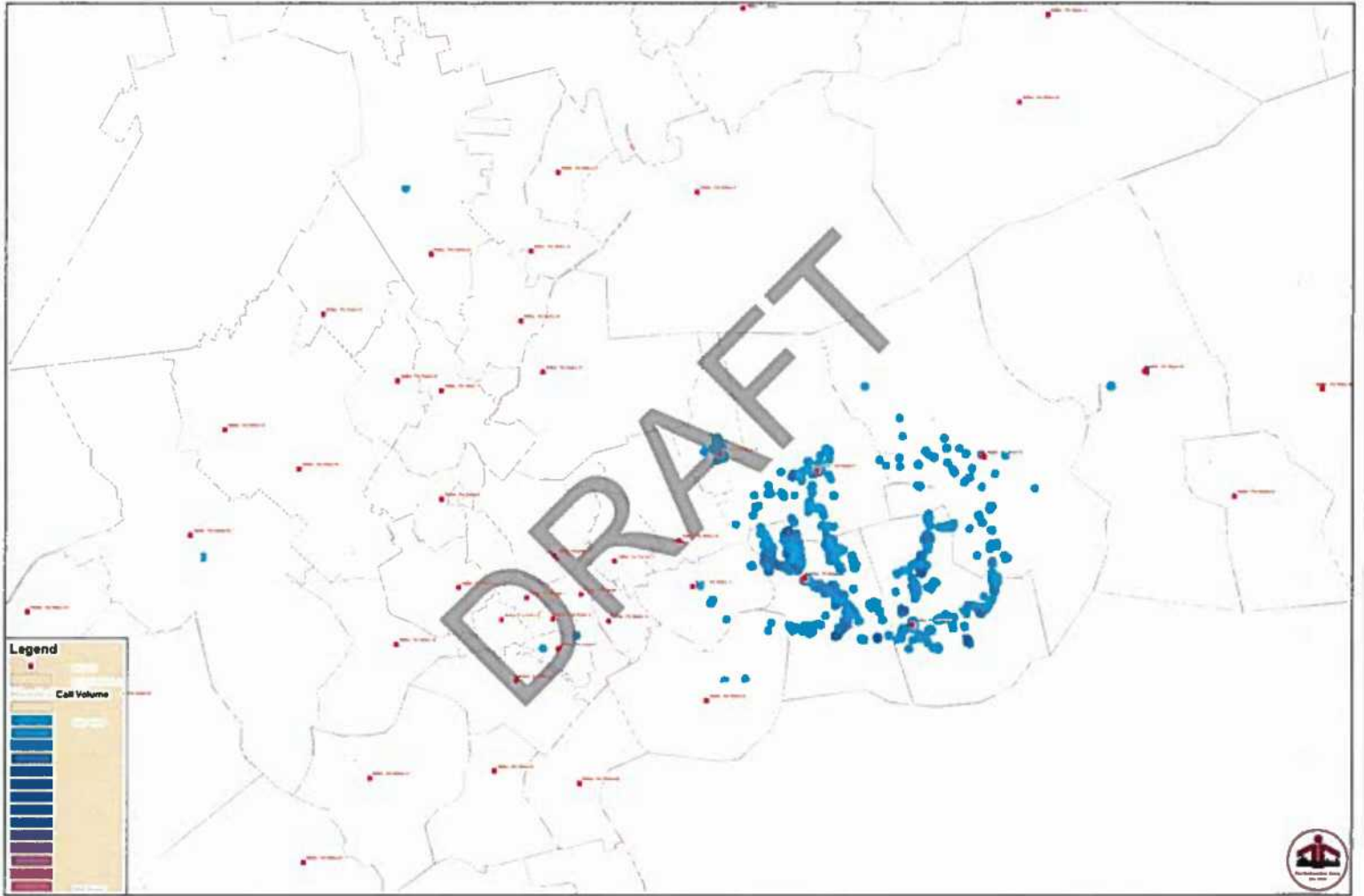


Table 4 is a breakdown of the fire calls by time of day for Station 20. The bulk of the calls are daytime and evening responses in this area.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	59	15.1%
Daytime	0700 – 1659	207	52.9%
Evening	1700 – 2359	125	32.0%

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 20 was assigned a Public Fire Protection Classification of 8 and Dwelling Protection Grade 3B.

Recommendations

- Station 20 should remain as an active volunteer station. Based on the number of calls and call types, the volunteer staffing is adequate for the level of risk and demand in the fire response zone. The current grades will be maintained with volunteer staffing.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 21

3035 Highway #7, Lake Echo



Station 21 is located in the community of Lake Echo off of Highway 7. Station 21 provides response to communities in the Lake Echo region of the Halifax Regional Municipality. Figure 1 shows the current 2.5 km, 5 km and 8 km response coverage area for Station 21. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area (5 km coverage) represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area (8 km coverage) represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is a composite station staffed by 15 volunteers and an E-Platoon of four career firefighters. The station houses a Rescue Engine and a Tanker.



Building and Tarmac

Station 21 is a wood-framed building with three apparatus bays. The station can adequately house the apparatus assigned to it.

The tarmac outside the station is a gravel covered area which extends from the bay door outward. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

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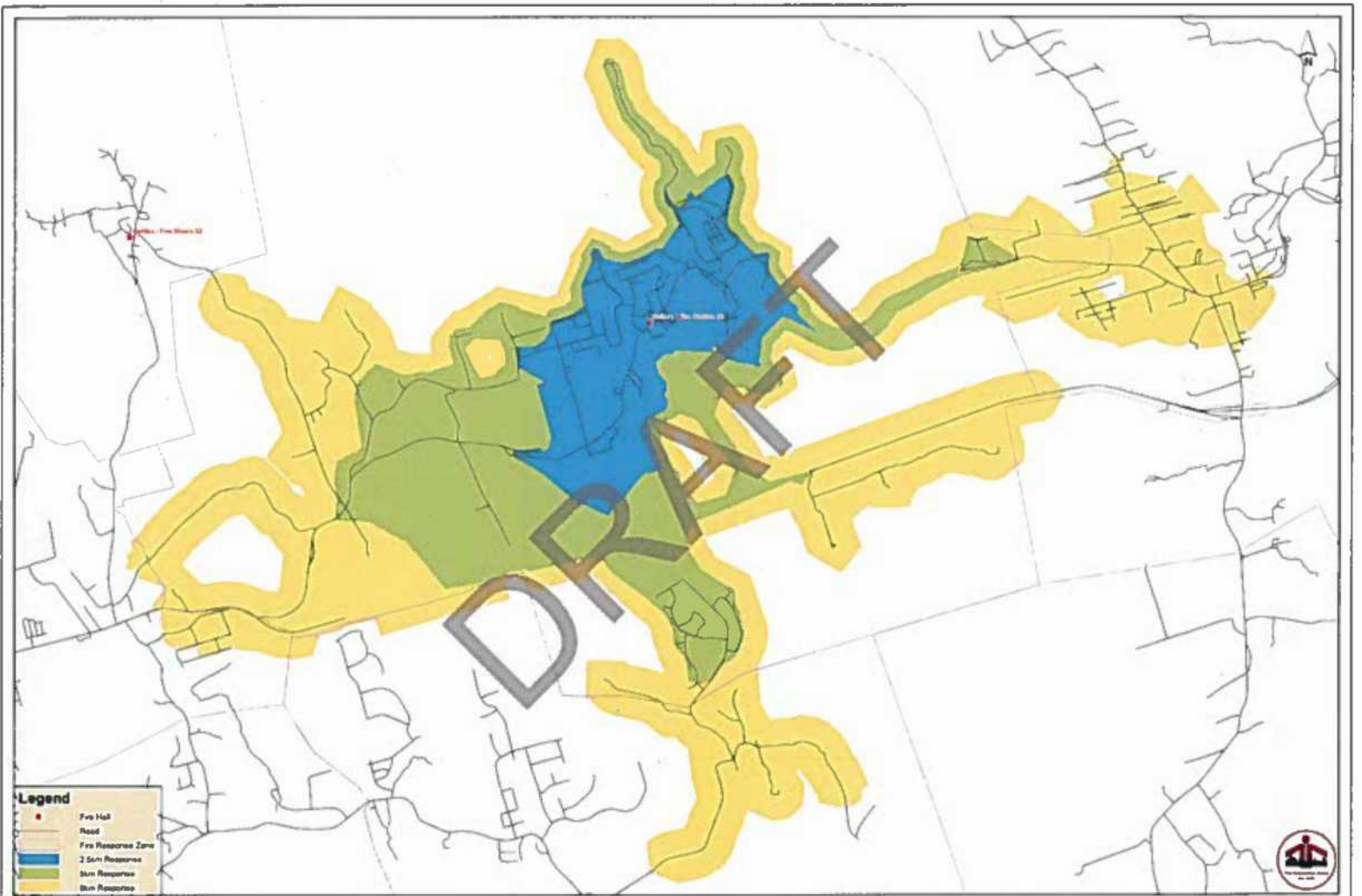


Figure 1 2 5/5km Response from Fire Station 21

Scale = 1:13,000

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities in Station 21 are adequate to meet the needs of the fire fighters.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

Community Risk Profile – Response Zone

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 2,087 Required Fire Flows were calculated for Response Zone 21 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 21

RFF Range	No. of RFF points
0-999 IGPM	481
1,000-1,999 IGPM	1,601
2,000-2,999 IGPM	4
3,000-3,999 IGPM	1
4,000-4,999 IGPM	0
>=5,000 IGPM	0



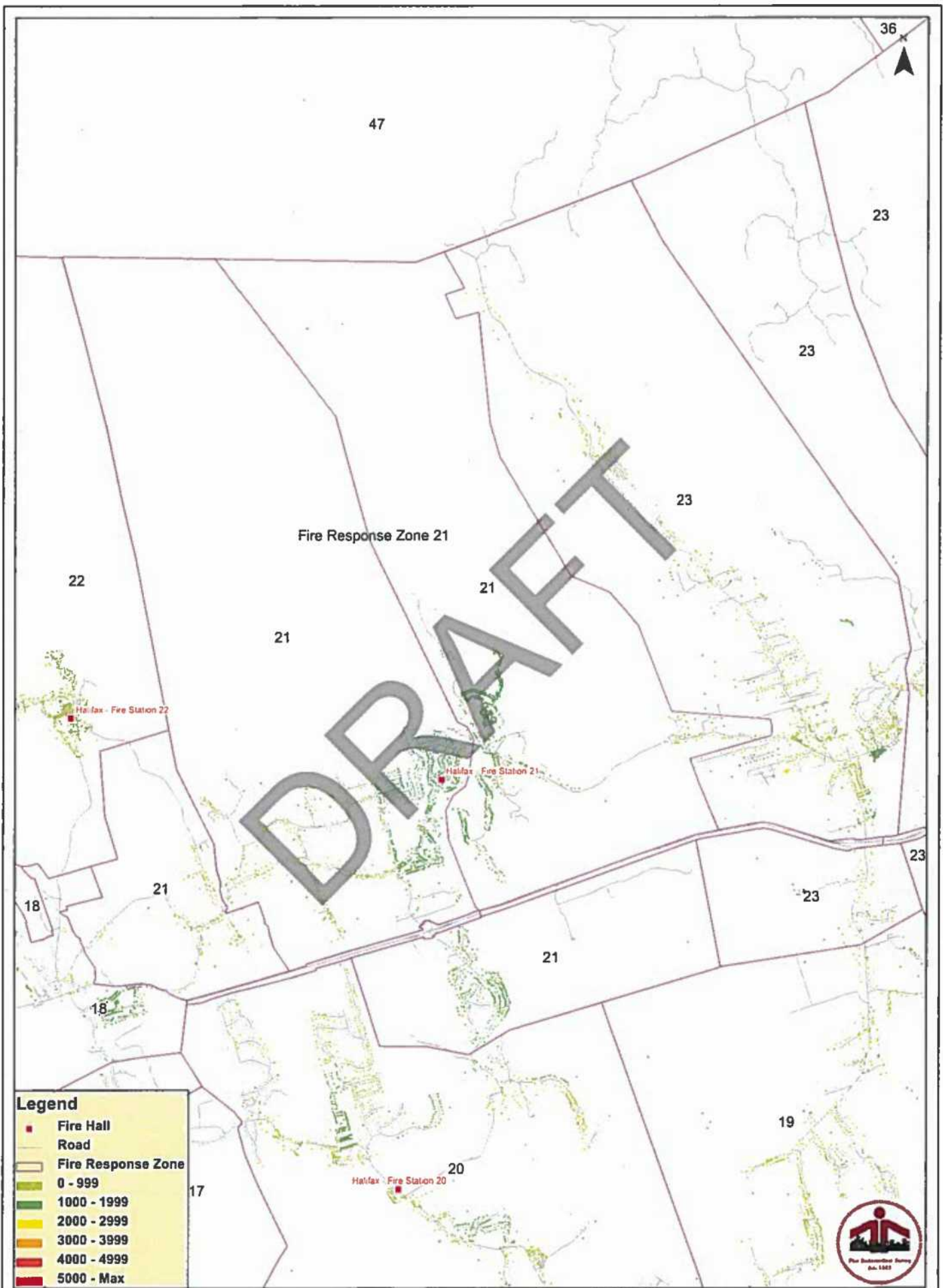


Figure 2 Halifax Fire Response Zone 21 - Building Footprints with RFF Value

The Basic Fire Flows assigned for Station 21 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited to large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for response zone 21 is based on the 95th percentile which is 1,200 imperial gallons per minute.

Table 2 Basic Fire Flows for HRM Response Zone 21

Total RFF Points	2,087	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,200	90.96
Max	3,000	227.40
5th highest	2,200	166.76

Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 21 is one Engine apparatus. Station 21 is equipped with one Engine which meets the minimum response requirement. Standard staffing for Station 21 is 15 volunteers and an E-Platoon of four career firefighters, which allows the station to meet the minimum initial response of four to six fire fighters available to respond on first alarms.

Fire Calls

In the period from January 2010 until September 2013 Station 21 received a total of 604 emergency calls with the breakdown by type as described in Table 3 and Figure 4 and 5 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or those for which the type of call could not be identified.

The majority of calls to this station were Medical calls at 46.4 percent of the total call volume.



Table 3 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	149	40	24.67
False alarm	39	10	6.46
Smoke	34	9	5.63
Motor Vehicle Accident	48	13	7.95
Oil or Gas spill	0	0	0.00
Other	7	2	1.16
Rescue	0	0	0.00
Medical Assist	280	75	46.36
Coding	47	13	7.77

Figure 3 Emergency Calls by Incident Type (2010-2013)

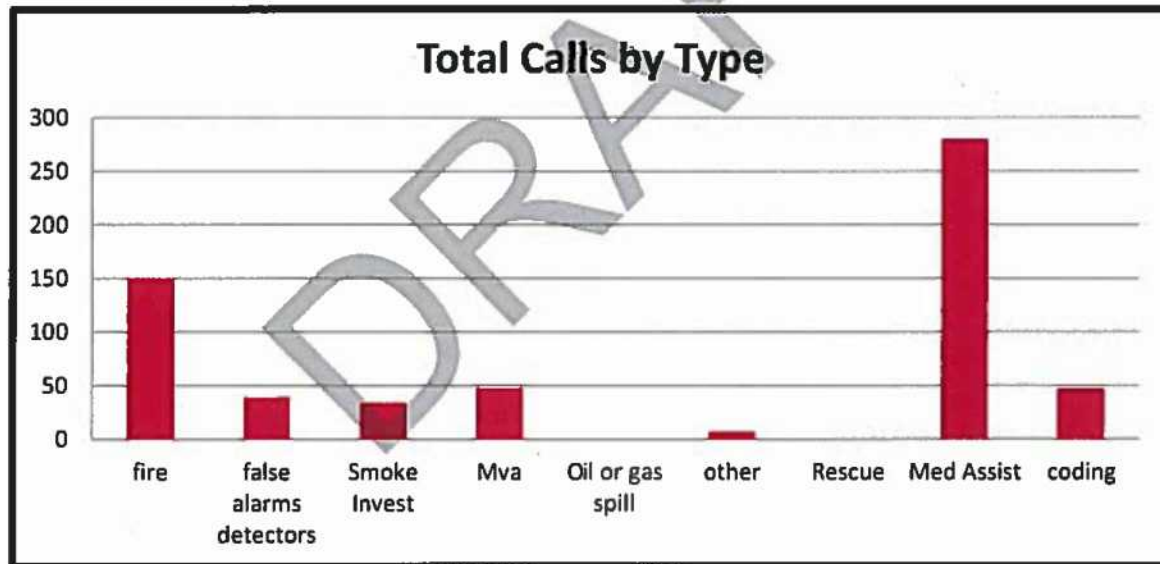


Figure 4 Percentage of Calls by Incident Type (2010-2013)

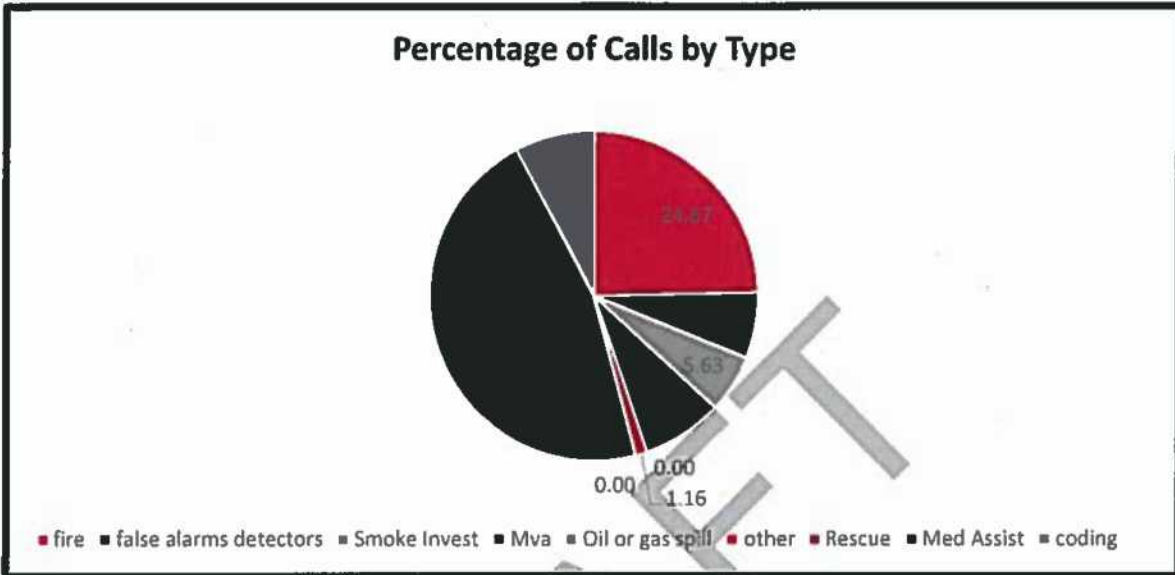
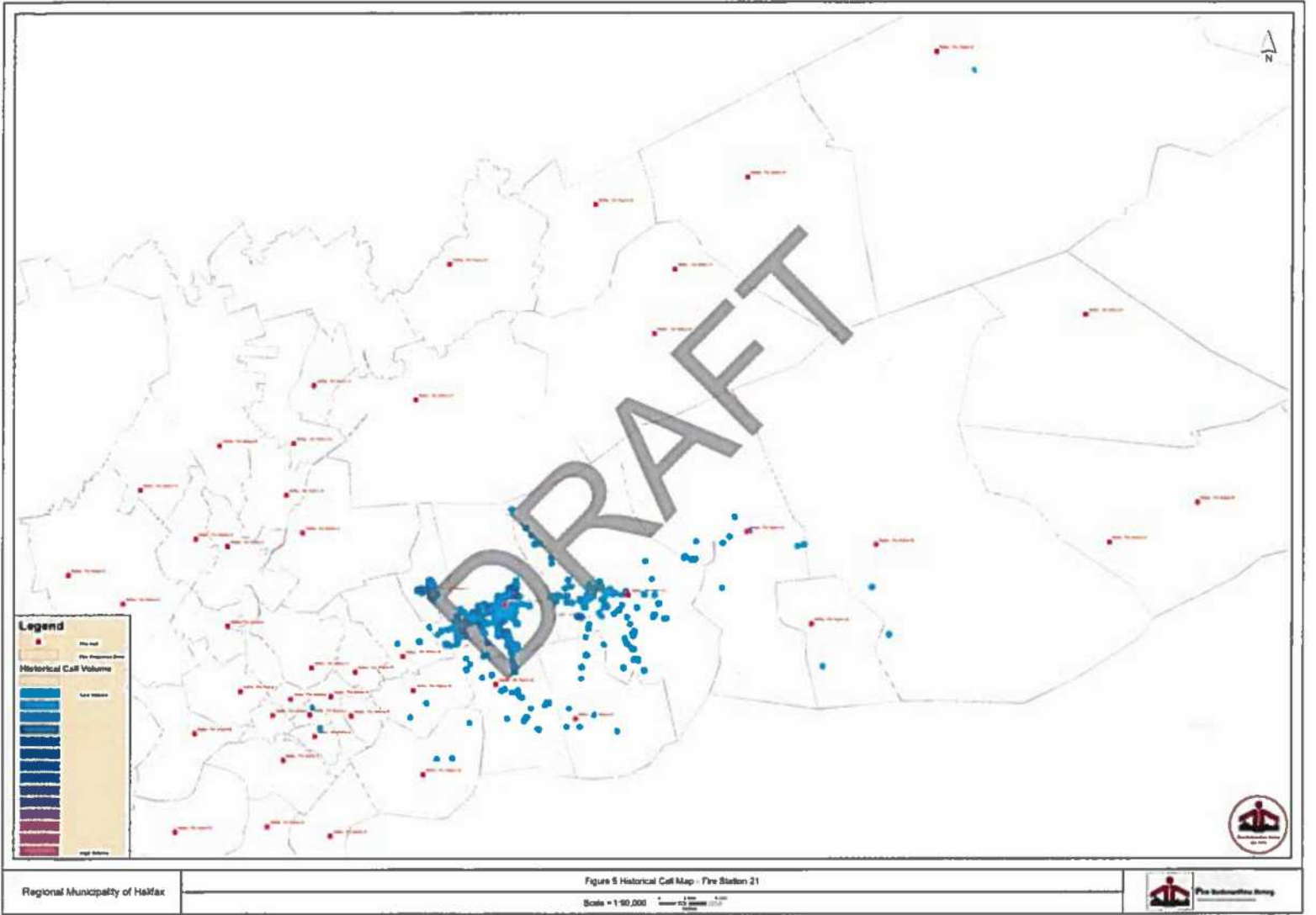


Table 4 is a breakdown of the fire calls by time of day for Station 21. The total number of calls in Table 4 does not include calls labelled as "Other" or "Coding". The bulk of the calls are daytime and evening calls.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	73	12.1%
Daytime	0700 – 1659	376	62.3%
Evening	1700 – 2359	155	25.7%





Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 21 was assigned a Public Fire Protection Classification of 8 and Dwelling Protection Grade 3B.

Recommendations

- Station 21 should remain operational as a composite station. In the long term, should the volunteer roster falls below 15, the station should be staffed 24/7 by career firefighters. Based on the number of calls and call types, the composite staffing meets all of the current fire protection requirements for the response zone.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 22

8 Cain Street, North Preston



Station 22 is located in the community of North Preston in the HRM, off of Cain Street. Figure 1 shows the current 2.5 km, 5 km and 8 km response coverage area for Station 22. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by two volunteers and houses one Tanker.

Building and Tarmac

The station construction is wood-framed with metal cladding. The building has two apparatus bays. The station can adequately house the apparatus assigned to it. The tarmac outside the station is an asphalt covered area which extends from the bay door outward. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.



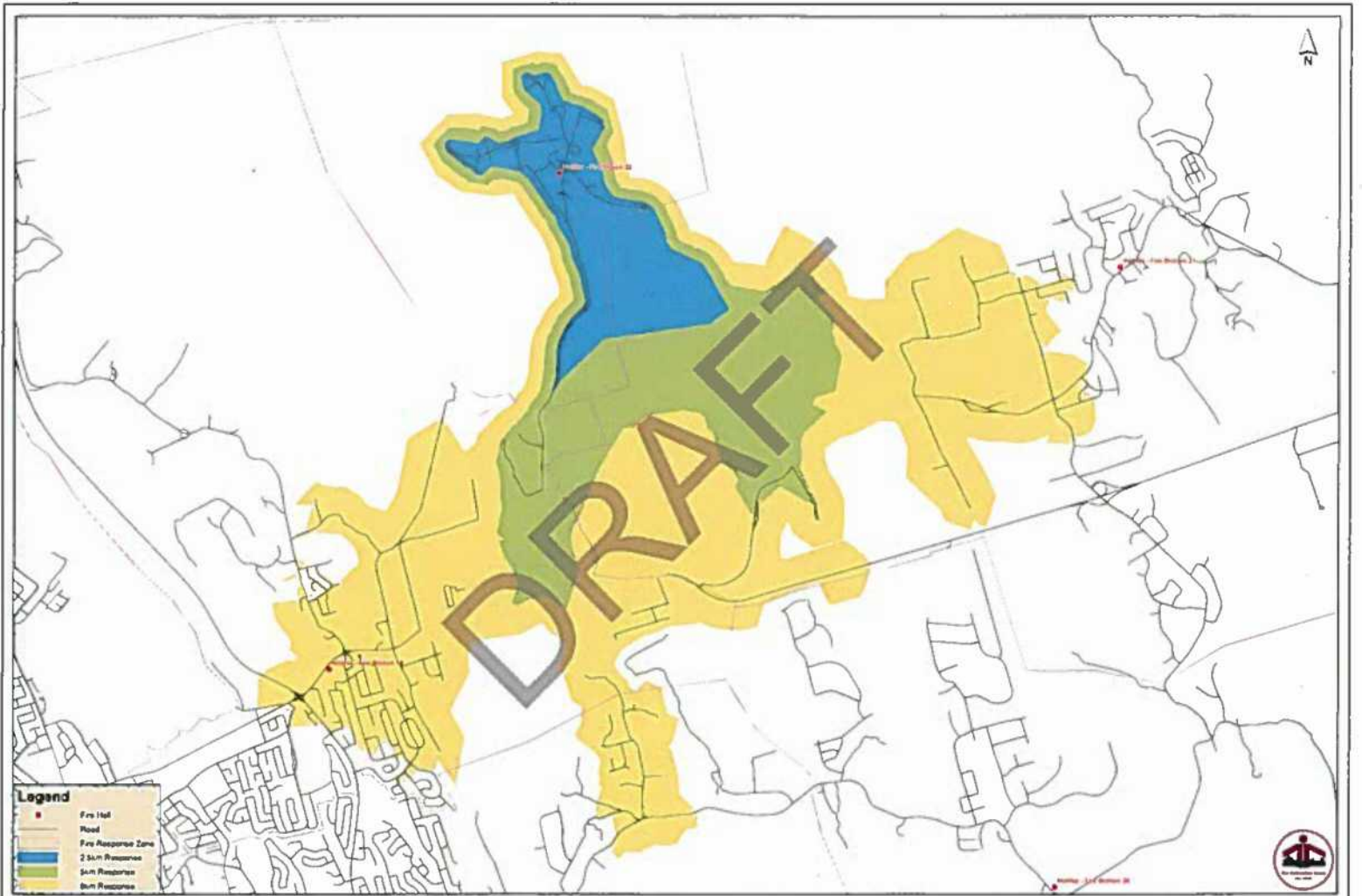


Figure 1.2 5/5/8km Response from Fire Station 22

Scale = 1:12,000

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities in Station 22 are adequate to meet the needs of the fire fighters.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

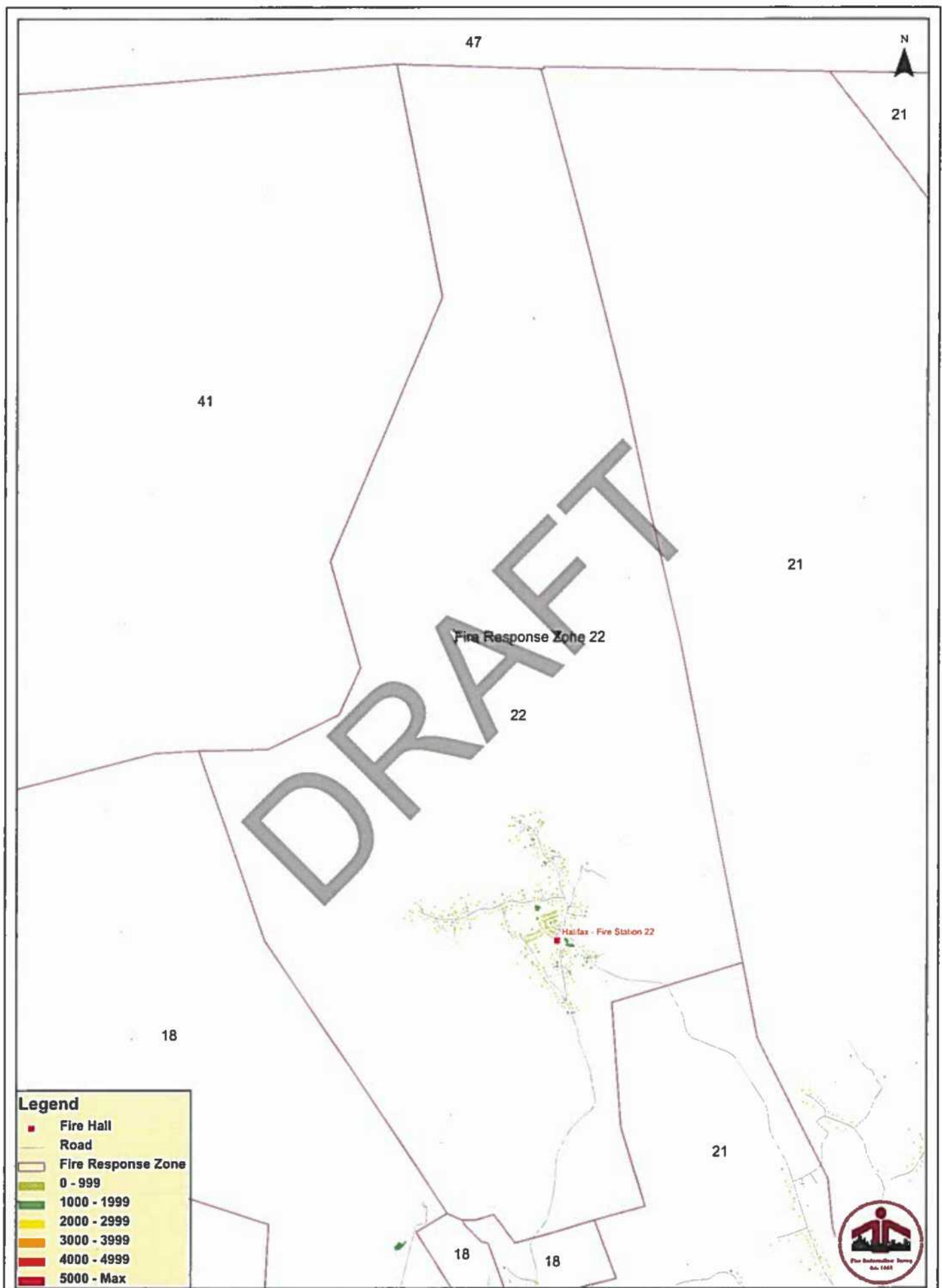
Community Risk Profile – Response Zone 22

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 372 Required Fire Flows were calculated for Response Zone 22 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 22

RFF Range	No. of RFF points
0-999 IGPM	294
1,000-1,999 IGPM	73
2,000-2,999 IGPM	5
3,000-3,999 IGPM	0
4,000-4,999 IGPM	0
>=5,000 IGPM	0





The Basic Fire Flows assigned for Station 22 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited to large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for response zone 22 is based on the 95th percentile which is 1,200 imperial gallons per minute.

Table 2 Basic Fire Flows for HRM Response Zone 22

Total RFF Points	372	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,200	90.96
Max	2,600	197.08
5th highest	2,000	151.60

Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 22 is one Engine apparatus. Station 22 is equipped with one Tanker and therefore does not meet the apparatus requirements for the response zone. Standard staffing for Station 22 is 2 volunteers, which is well below the minimum requirement of 15 volunteers or four to six career fire fighters on a fire department roster to provide adequate response and be recognized for fire insurance grading purposes. Too few personnel at an emergency scene lessen the effectiveness of the response and increase the risk of injury to those present at the scene. Due to the apparatus and staffing deficiencies Station 22 is determined to be redundant and is not recognized for fire insurance grading.

Fire Calls

In the period from January 2010 until September 2013 Station 22 received 87 emergency calls. All calls at Station 22 are covered and mutually responded to by Station 21 in Lake Echo. The breakdown by call type is shown in Table 3 and Figure 3 and 4 below. The year average was calculated for all calls over the 45 months reviewed. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls that could not be identified.



The majority of emergency calls to this station were Medical calls at 47.1% of the total call volume.

Table 3 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	29	8	33.33
False alarm	7	2	8.05
Smoke	2	0.5	2.30
Motor Vehicle Accident	2	0.5	2.30
Oil or Gas spill	0	0	0.00
Other	0	0	0.00
Rescue	0	0	0.00
Medical Assist	40	11	47.12
Coding	7	2	6.90

Table 4 is a breakdown of the fire calls by time of day for Station 22. The majority of the calls are daytime and evening responses in this area.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	15	17.2%
Daytime	0700 – 1659	40	46.0%
Evening	1700 – 2359	32	36.8%



Figure 3 Emergency Calls by Incident Type (2010-2013)

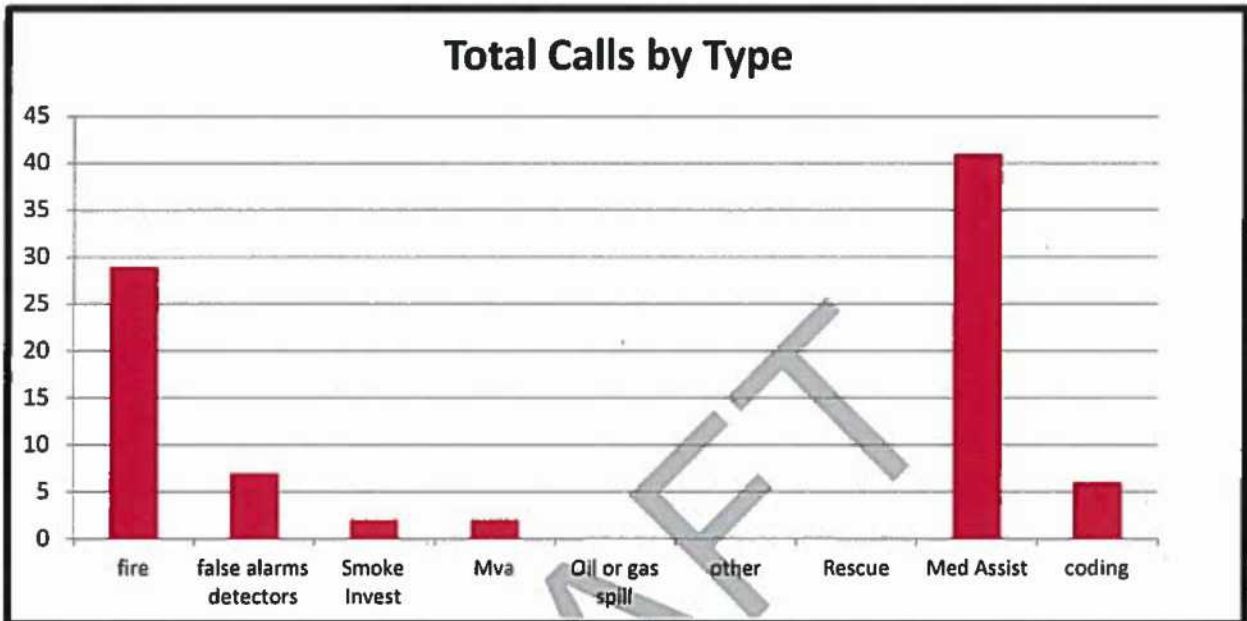
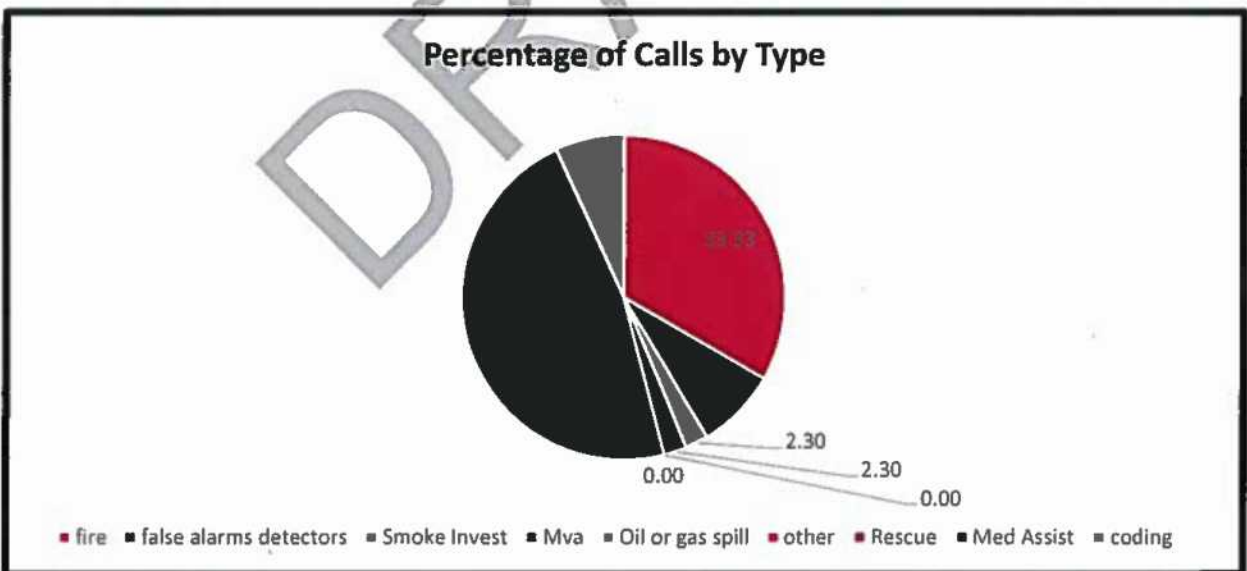


Figure 4 Percentage of Calls by Incident Type (2010-2013)



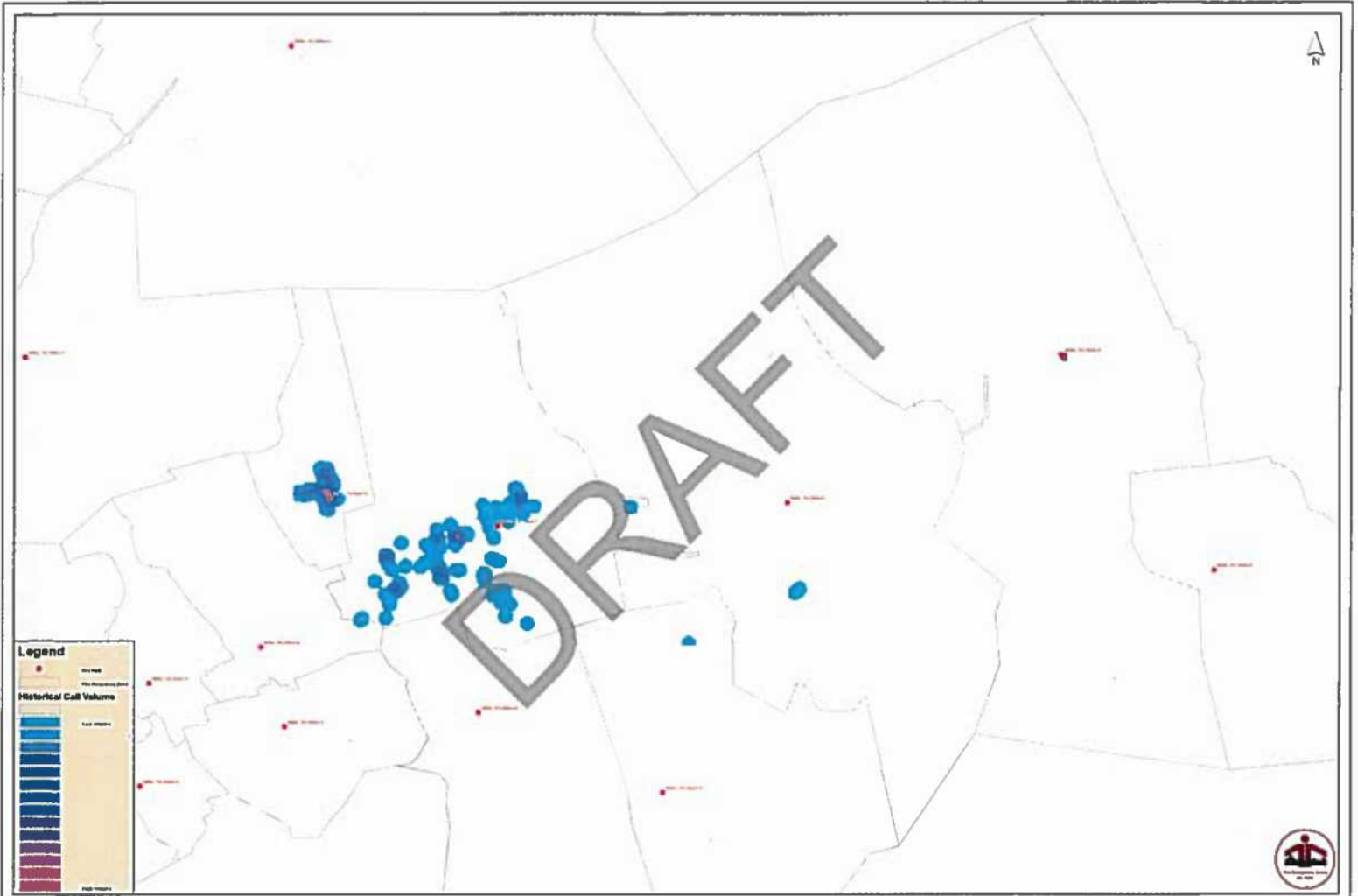


Figure 5 Historical Call Map - Fire Station 22

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 22 was assigned a Public Fire Protection Classification of 10 and Dwelling Protection Grade 5.

Recommendations

- Close Station 22. The number of volunteer firefighters at Station 22 is well below the minimum staffing requirements of 15 volunteer fire fighters for response to the risks in this area and for fire insurance grading purposes. In addition the apparatus at this station does not meet the requirements as determined by the Basic Fire Flow in the response zone. Due to staffing and apparatus deficiencies, the station response is not recognized for fire insurance grading. Operating this station therefore presents an undue cost with no corresponding insurance savings. The station is redundant and should be closed.



STATION 23
5543 Highway 7



Station 23 is located in the community of Head of Chezzetcook off of Highway No. 7. Head of Chezzetcook is located in the municipal Planning Districts 8 & 9 Plan Area (Lake Echo/Porters Lake). Station 23 provides response to communities in Head Chezzetcook and is located in a fairly central position for response. Figure 1 shows the current 2.5 km, 5 km and 8 km response coverage area for Station 23. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by 14 volunteers and houses an Engine, Tanker, Rescue vehicle and a Rescue boat.



Building and Tarmac

The station was constructed in 1960 of concrete block with vinyl siding and asphalt shingles on the roof. The two story station is approximately 7,750 square feet with three apparatus bays.

The tarmac outside the station is an asphalt covered area which extends from the bay door to the street and covers approximately 3,875 square feet. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities are adequate to meet the needs of the fire fighters. However the station should be better organized and tidy.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.



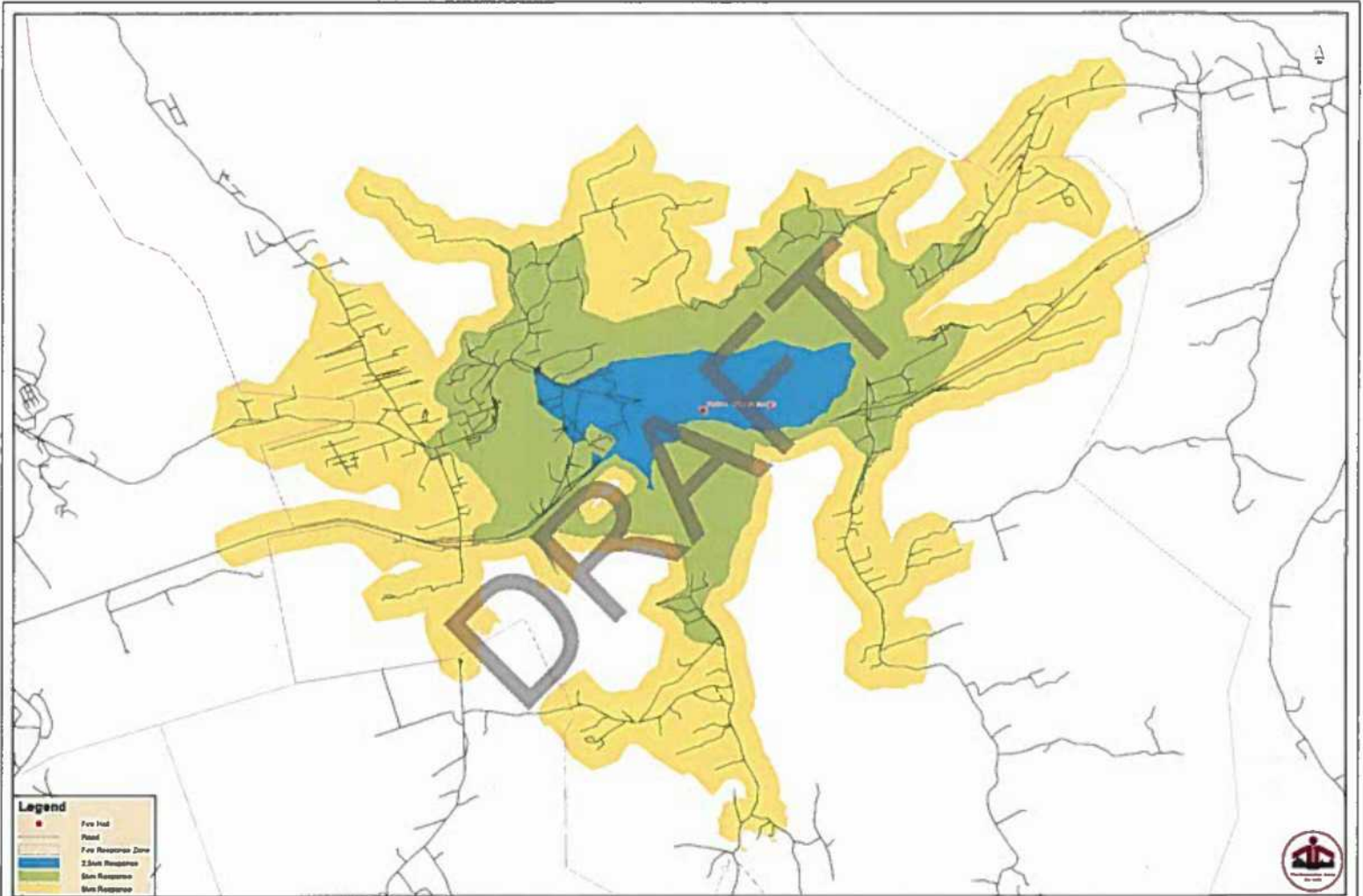


Figure 1 - 2.55/8km Response from Fire Station 23

Community Risk Profile – Response Zone 23

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 3,219 Required Fire Flows were calculated for Response Zone 23 as shown in Figure 2 below.

The Basic Fire Flows assigned for Station 23 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited to large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for response zone 23 is based on the 95th percentile which is 1,200 imperial gallons per minute.

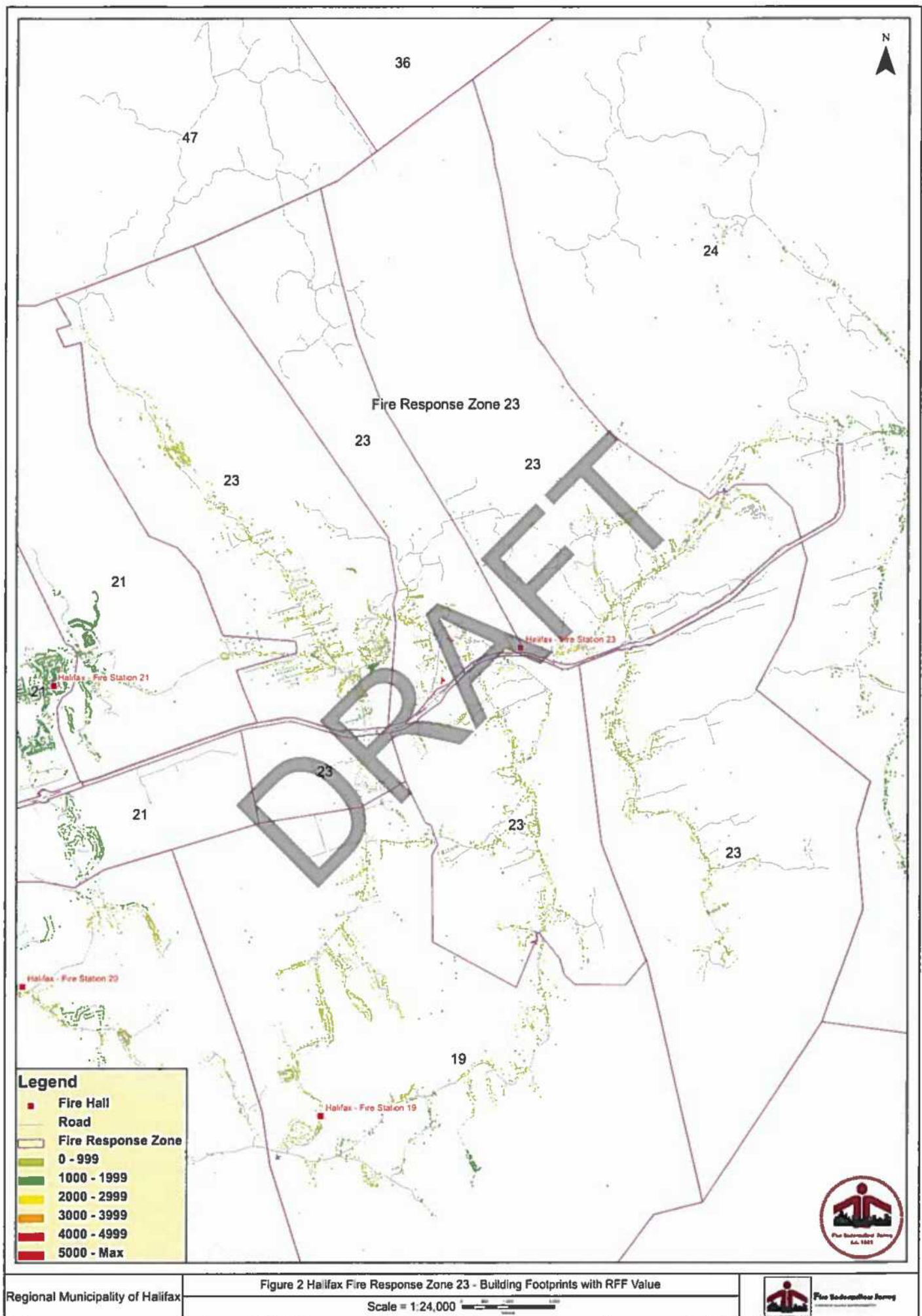
Table 1 Required Fire Flow ranges in Response Zone 23

RFF Range	No. of RFF points
0-999 IGPM	2,282
1,000-1,999 IGPM	922
2,000-2,999 IGPM	12
3,000-3,999 IGPM	1
4,000-4,999 IGPM	2
>=5,000 IGPM	0

Table 2 Basic Fire Flows for HRM Response Zone 23

Total RFF Points	3,219	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,200	90.96
Max	4,600	348.68
5th highest	2,700	204.66





Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 23 is one Engine apparatus. Station 23 is equipped with one Engine. Standard staffing for Station 23 is 14 volunteers, which is below the minimum of 15 volunteer fire fighters required to provide an adequate response and be recognized for fire insurance grading. The number of volunteers should be increased to a minimum of 15.

Fire Calls

In the period from January 2010 until September 2013 Station 23 had 924 emergency calls with the following breakdown as shown in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls could not be identified.

The majority of calls to this station were Medical calls at 45 percent of the total call volume.

Table 3 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year Average	Percentage (%)
Fire	144	38	15.58
False alarm	70	19	7.58
Smoke	47	13	5.09
Motor Vehicle Accident	94	25	10.17
Oil or Gas spill	2	1	0.22
Other	9	2	0.97
Rescue	6	2	0.65
Medical Assist	420	112	45.45
Coding	132	35	14.29



Figure 3 Emergency Calls by Incident Type (2010-2013)

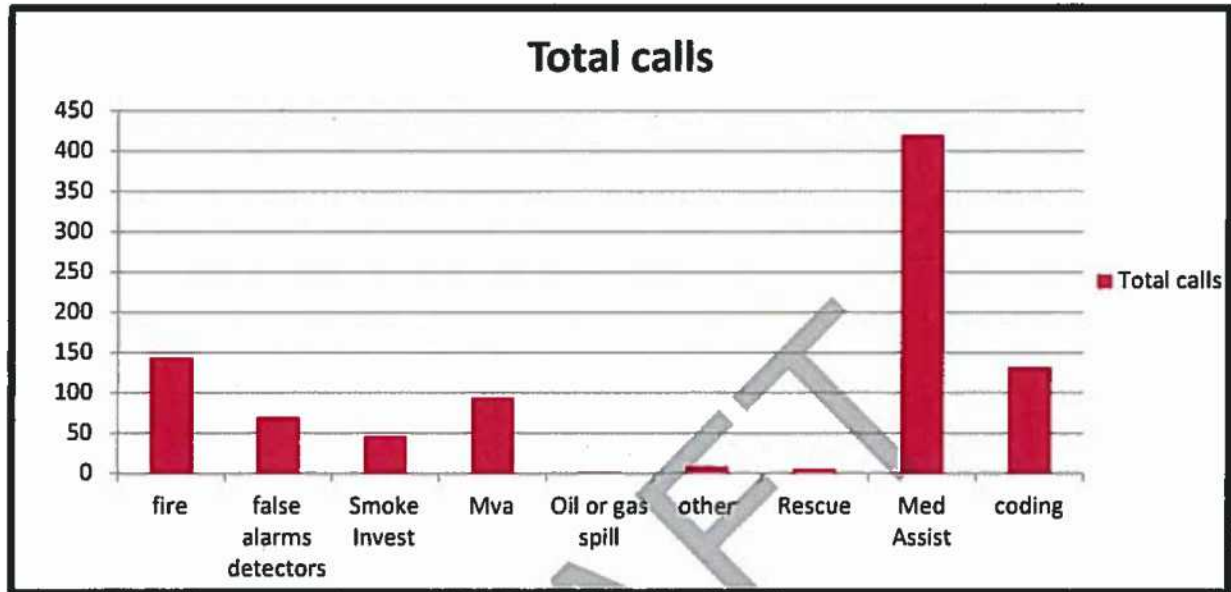


Figure 4 Percentage of Calls by Incident Type (2010-2013)

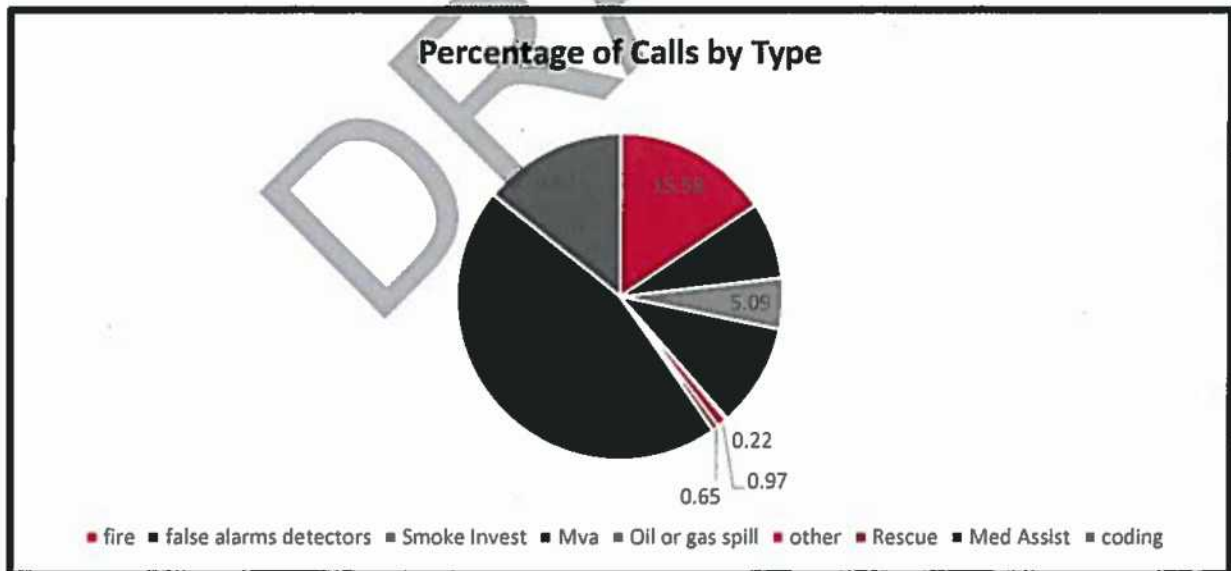


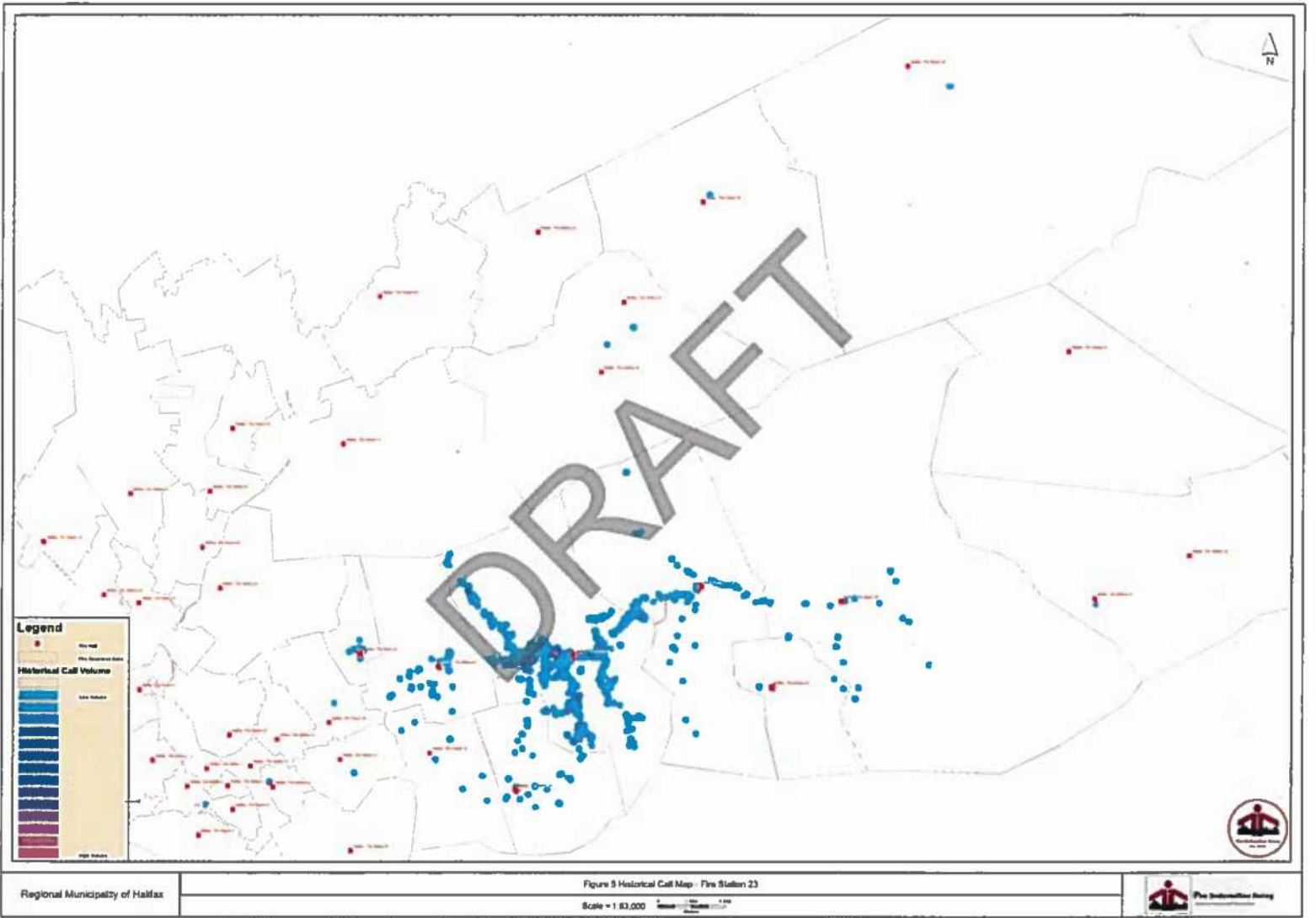
Table 4 is a breakdown of the fire calls by time of day for Station 23. The bulk of the calls are daytime and evening responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	136	14.7%
Daytime	0700 – 1659	457	49.5%
Evening	1700 – 2359	331	35.8%

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Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 23 was assigned a Public Fire Protection Classification of 10 and Dwelling Protection Grade 5.

Recommendations

- Increase the number of volunteers at Station 23 to a minimum of 15 volunteers to provide an adequate response and meet the minimum requirements for fire insurance grading recognition.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 24
32 Riverside Avenue



Station 24 is located in the in the Musquodoboit Harbour region on the Eastern Shore in Halifax Regional Municipality. Station 24 provides response to rural communities in Musquodoboit Harbour and is located in a fairly central position for response. Figure 1 shows the current 2.5 km, 5 km and 8 km response coverage area for Station 24. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by 12 volunteers and an E-platoon, and houses an Engine, Tanker, Rescue vehicle and a Rescue boat.



Building and Tarmac

The station building is wood frame with vinyl siding and an asphalt shingle roof. The station is two stories and is approximately 5,150 square feet.

The tarmac outside the station is an asphalt covered area which extends from the bay door to the street and covers approximately 5,170 square feet. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities in this station were found to be in average condition.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.



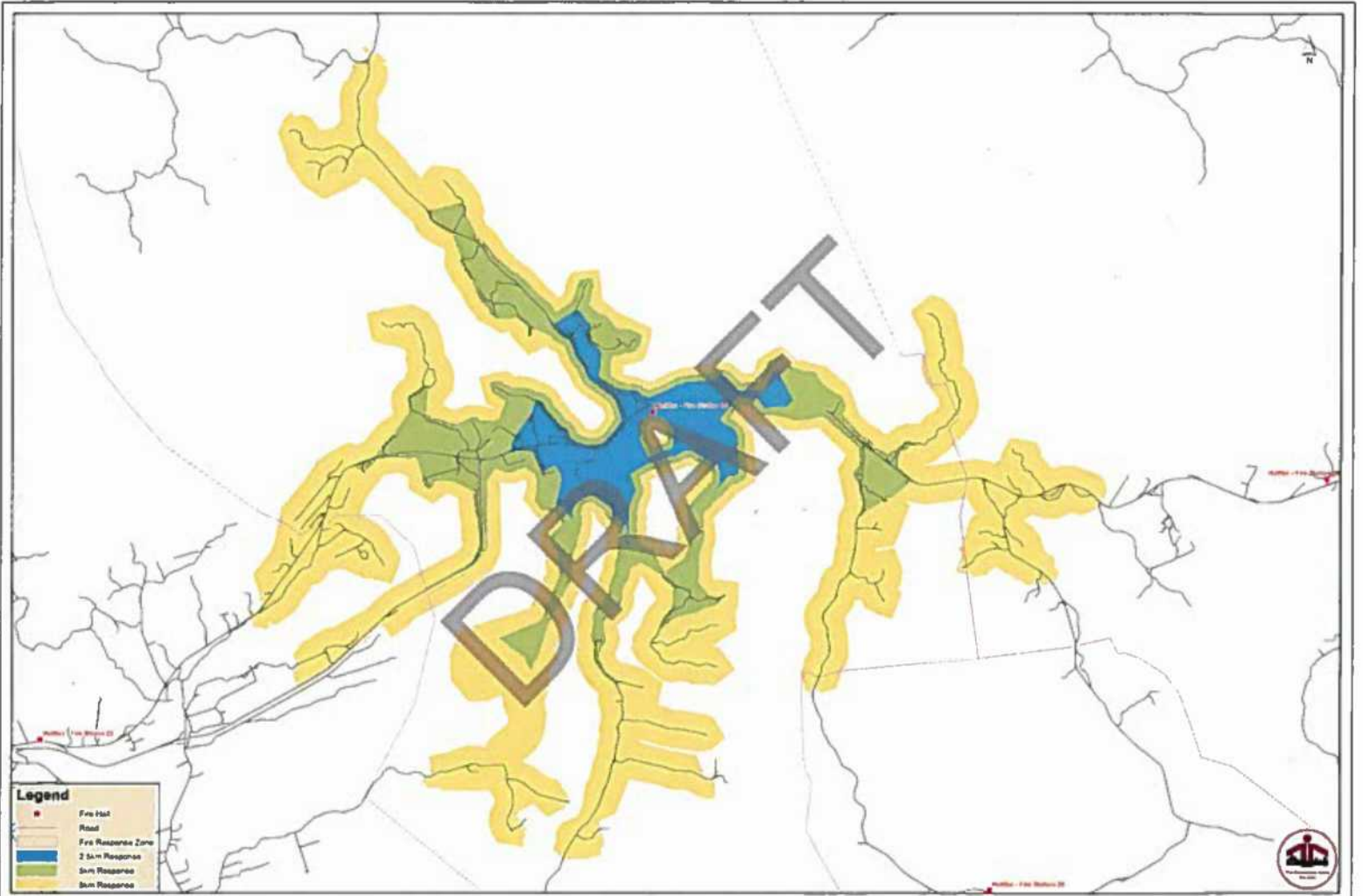


Figure 1-2.5/8km Response from Fire Station 24

Scale = 1:18,000

Community Risk Profile – Response Zone 24

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community’s fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 1,413 Required Fire Flows were calculated for Response Zone 24 as shown in Figure 2 below. The Basic Fire Flows assigned for Station 24 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited to large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for response zone 24 is based on the 95th percentile which is 1,200 imperial gallons per minute.

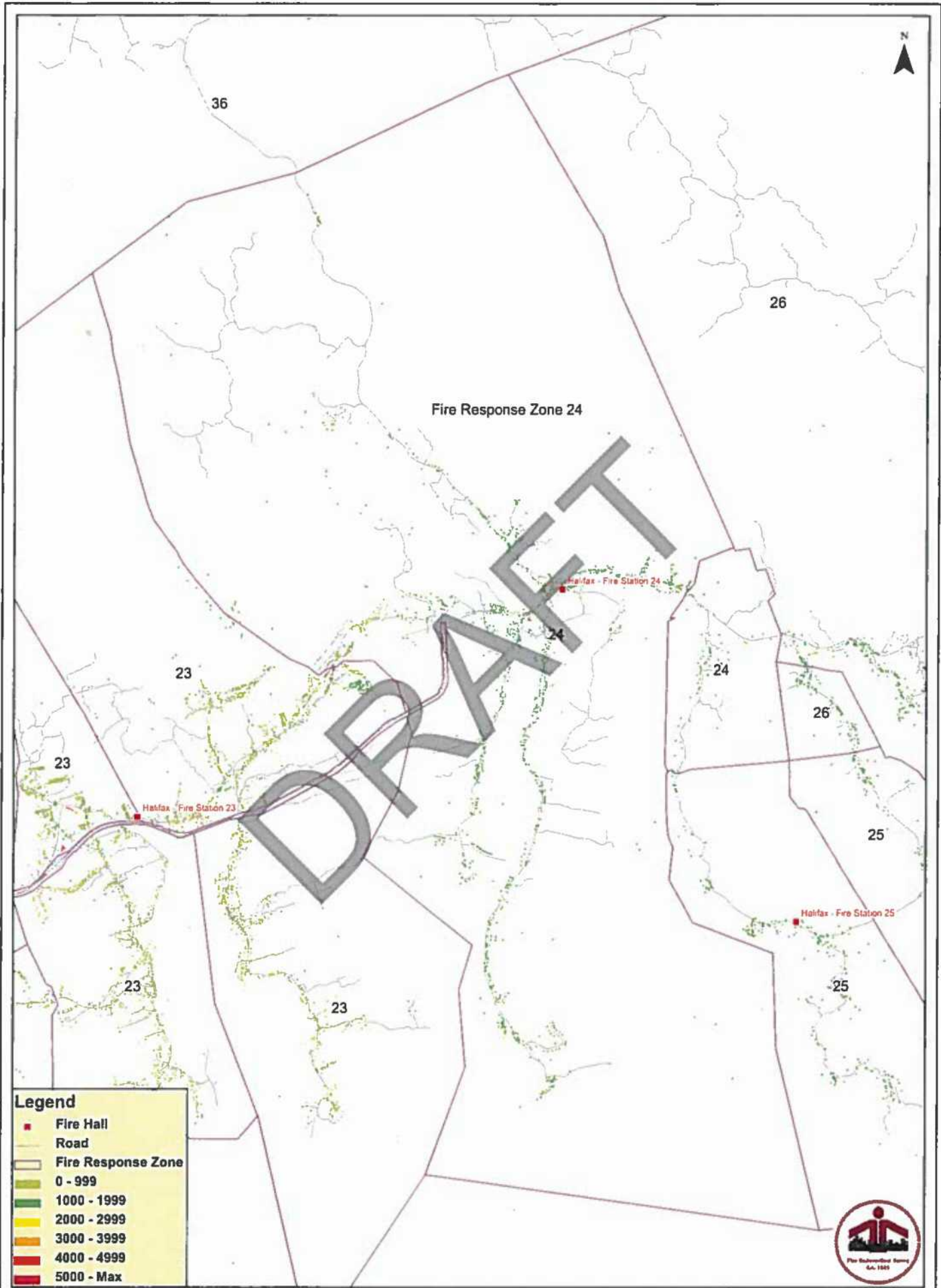
Table 1 Required Fire Flow ranges in Response Zone 24

RFF Range	No. of RFF points
0-999 IGPM	248
1,000-1,999 IGPM	1,156
2,000-2,999 IGPM	6
3,000-3,999 IGPM	2
4,000-4,999 IGPM	1
>=5,000 IGPM	0

Table 2 Basic Fire Flows for HRM Response Zone 24

Total RFF Points	1,413	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,200	90.96
Max	4,100	310.78
5th highest	2,500	189.50





Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 24 is one Engine apparatus. Station 24 is equipped with one Engine. Standard staffing for Station 24 is 12 volunteers and an E-platoon for daytime coverage which allows the station to meet the minimum initial response of four to six fire fighters available to respond on first alarms.

Fire Calls

In the period from January 2010 until September 2013 Station 24 received 372 emergency calls as shown in Table 3 and Figure 3 and 4 below. The year average was calculated for all calls over the 45 months reviewed. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls that could not be identified. The majority of calls responded to from this station were Medical calls at 39.5% of the total call volume.

Table 3 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	53	14	14.25
False alarm	27	7	7.26
Smoke	10	3	2.69
Motor Vehicle Accident	41	11	11.02
Oil or Gas spill	0	0	0.00
Other	14	4	3.76
Rescue	3	1	0.81
Medical Assist	147	39	39.51
Coding	77	21	20.70



Figure 3 Emergency Calls by Incident Type (2010-2013)

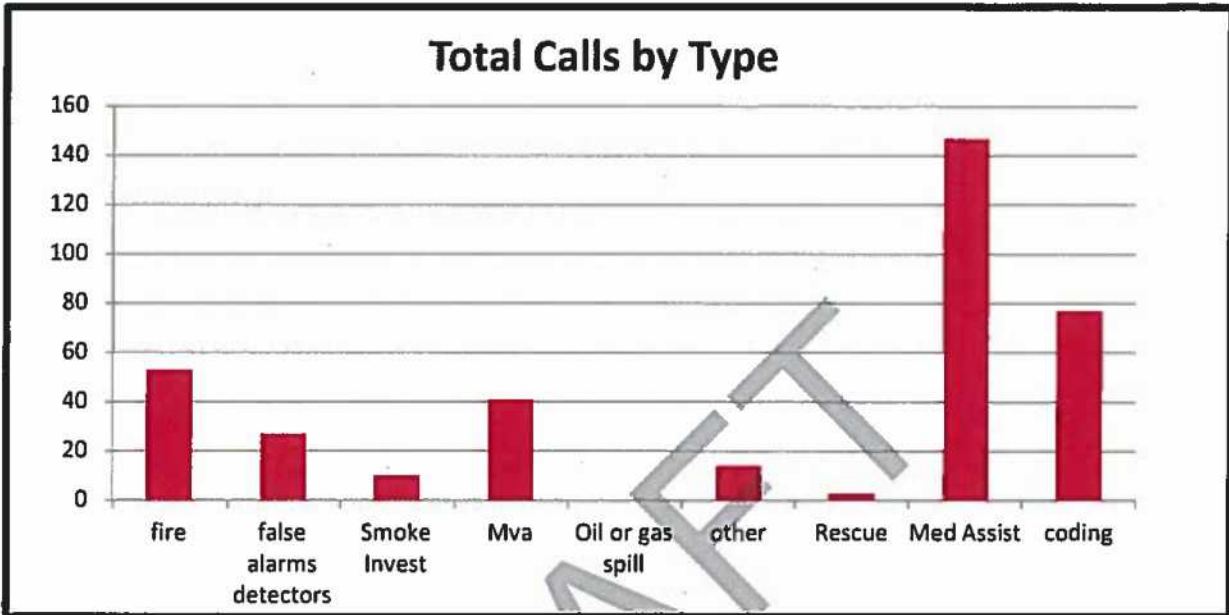


Figure 4 Percentage of Calls by Incident Type (2010-2013)

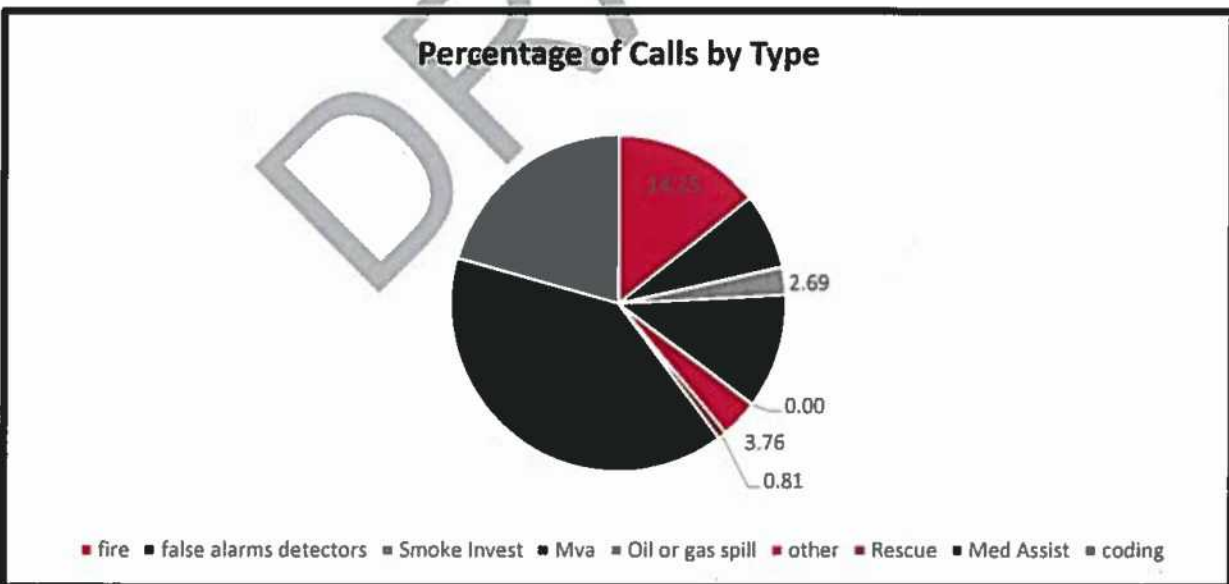


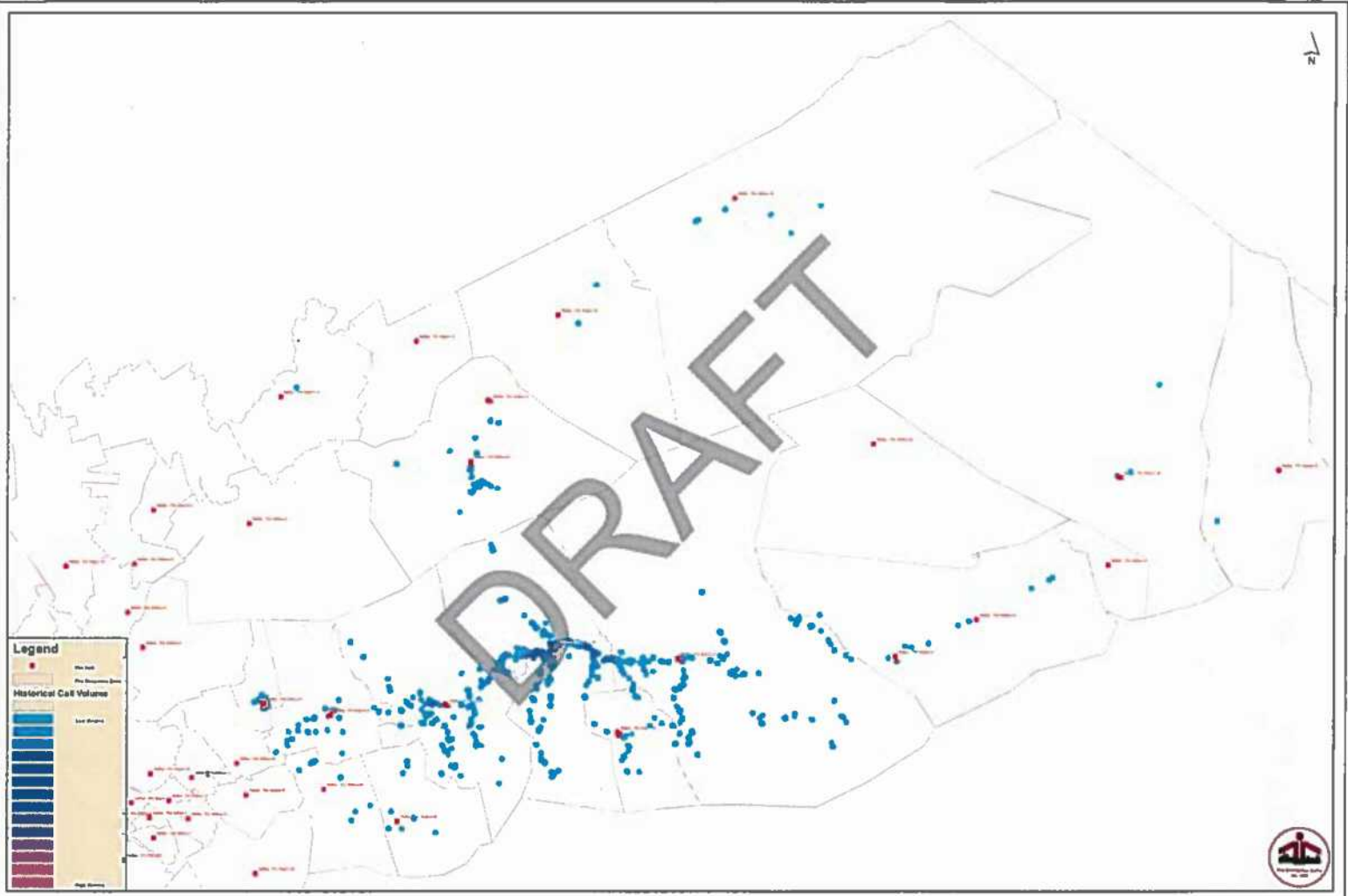
Table 4 is a breakdown of the fire calls by time of day for Station 24. The bulk of the calls are daytime responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	38	10.2%
Daytime	0700 – 1659	219	58.9%
Evening	1700 – 2359	115	30.9%

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Legend

- Site Location
- Historical Call Volume
- Call Volume
- Low Volume
- High Volume

Figure 5 Historical Call Map - Few Station 24

Scale = 1:100,000

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 24 was assigned a Public Fire Protection Classification of 8 and Dwelling Protection Grade 3B.

Recommendations

- The number of volunteers at Station 24 is below the minimum required and as such more volunteers should be recruited to increase the roster level to a minimum of 15 volunteer firefighters to improve evening and night time response.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 25

1765 Ostrea Lake Rd, Ostrea Lake



Station 25 is located in the community of Ostrea Lake in the HRM, off of Ostrea Lake Road. Figure 1 shows the current 2.5 km, 5 km and 8 km response coverage area for Station 25. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by 5 volunteer fire fighters and houses one Tanker.

Building and Tarmac

The station construction is wood frame with two apparatus bays. The ceiling height in one of the apparatus bays provides minimal clearance for the current fire apparatus. The station can adequately house a single apparatus.

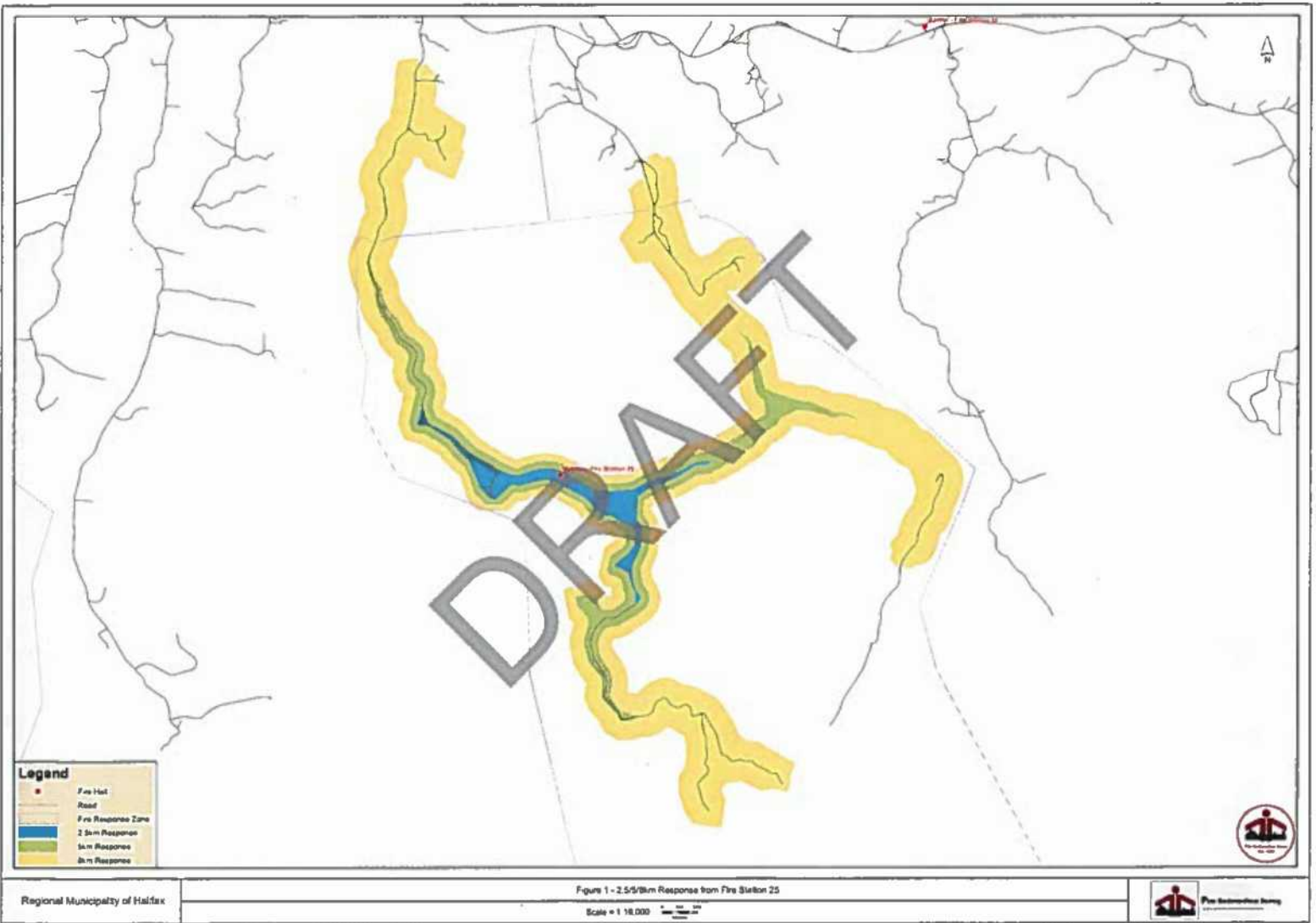
February 2015



The tarmac outside the station is a gravel covered area which extends from the bay door outward. The tarmac provides minimal room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

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Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities in Station 25 are not adequate to meet the needs of the fire fighters. Fire stations should be equipped with male and female washrooms, recreational areas, training space, proper storage areas and maintenance space.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

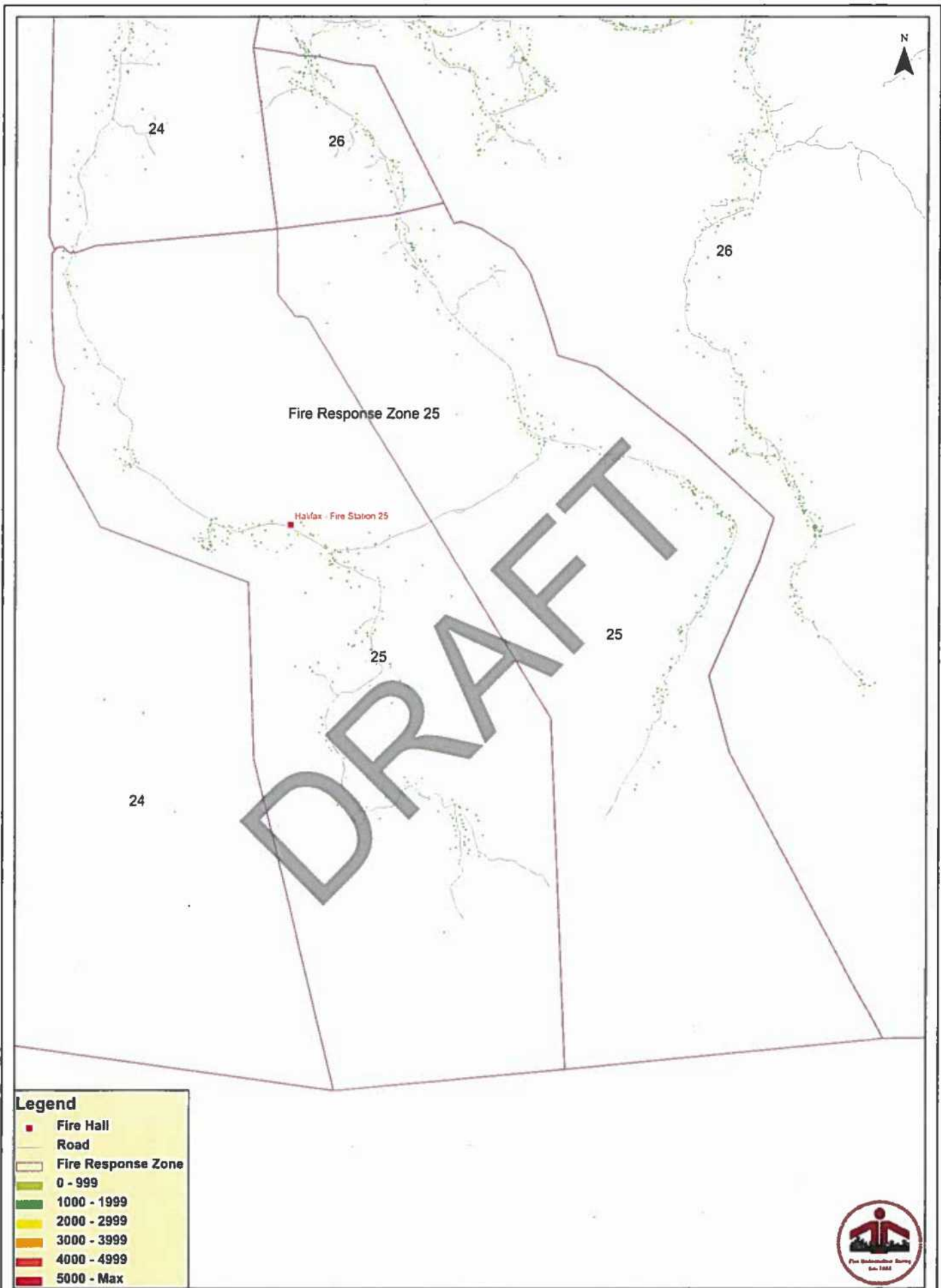
Community Risk Profile – Response Zone 25

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 394 Required Fire Flows were calculated for Response Zone 25 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 25

RFF Range	No. of RFF points
0-999 IGPM	14
1,000-1,999 IGPM	380
2,000-2,999 IGPM	0
3,000-3,999 IGPM	0
4,000-4,999 IGPM	0
>=5,000 IGPM	0





Legend

- Fire Hall
- Road
- Fire Response Zone
- 0 - 999
- 1000 - 1999
- 2000 - 2999
- 3000 - 3999
- 4000 - 4999
- 5000 - Max

Figure 2 Halifax Fire Response Zone 25 - Building Footprints with RFF Value

The Basic Fire Flows assigned for Station 25 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile or the 5th highest RFF in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited to large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for response zone 25 is based on the 95th percentile which is 1,200 imperial gallons per minute.

Table 2 Basic Fire Flows for HRM Response Zone 25

Total RFF Points	394	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,200	90.96
Max	1,200	90.96
5th highest	1,200	90.96

Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 25 is one Engine apparatus. Station 25 is equipped with one Tanker. Standard staffing for Station 25 is 5 volunteers, which is well below the minimum of 15 volunteers or four full-time staff required on a fire department roster to provide adequate response and be recognized for fire insurance grading purposes.

Fire Calls

In the period from January 2010 until September 2013 Station 25 received 28 emergency calls. The breakdown by call type is shown in Table 3 and Figure 3 and 4 below. The year average was calculated for all calls over the 45 months reviewed. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls that could not be identified.

The majority of calls to Station 25 were Medical calls at 50% of the total call volume.



Table 3 Emergency calls by Incident Type

Call by type			
Type	Total	Year Average	Percentage (%)
Fire	6	1.6	21.43
False alarm	2	0.5	7.14
Smoke	0	0	0.00
Motor Vehicle Accident	2	0.5	7.14
Oil or Gas spill	0	0	0.00
Other	0	0	0.00
Rescue	0	0	0.00
Medical Assist	14	4	50.00
Coding	4	1	14.29

Figure 3 Emergency Calls by Incident Type (2010-2013)

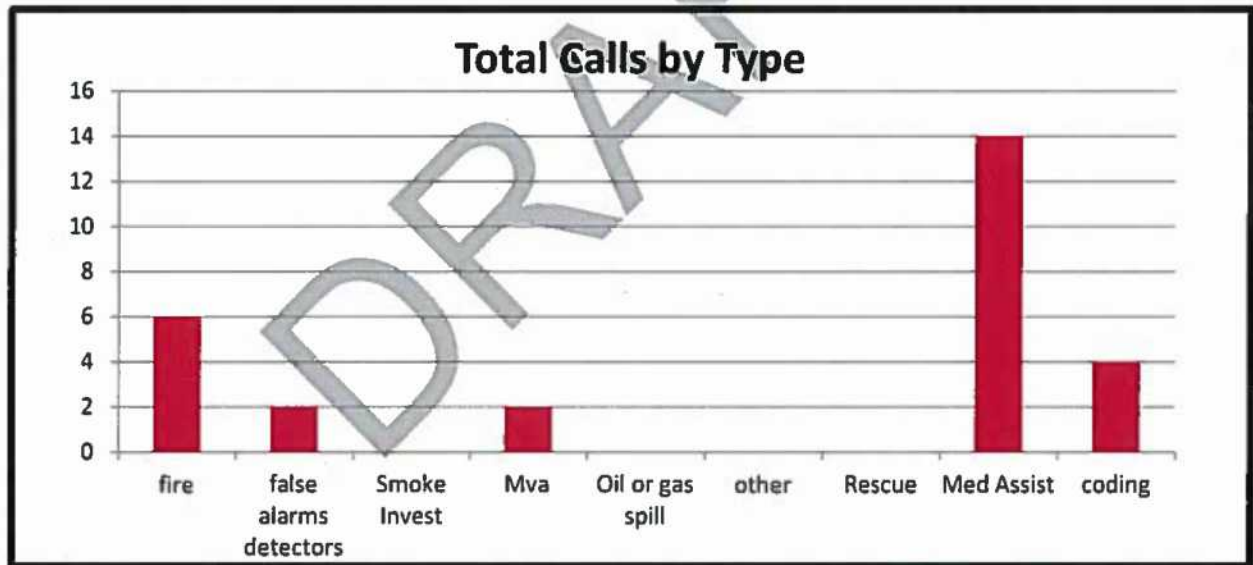


Figure 4 Percentage of Calls by Incident Type (2010-2013)

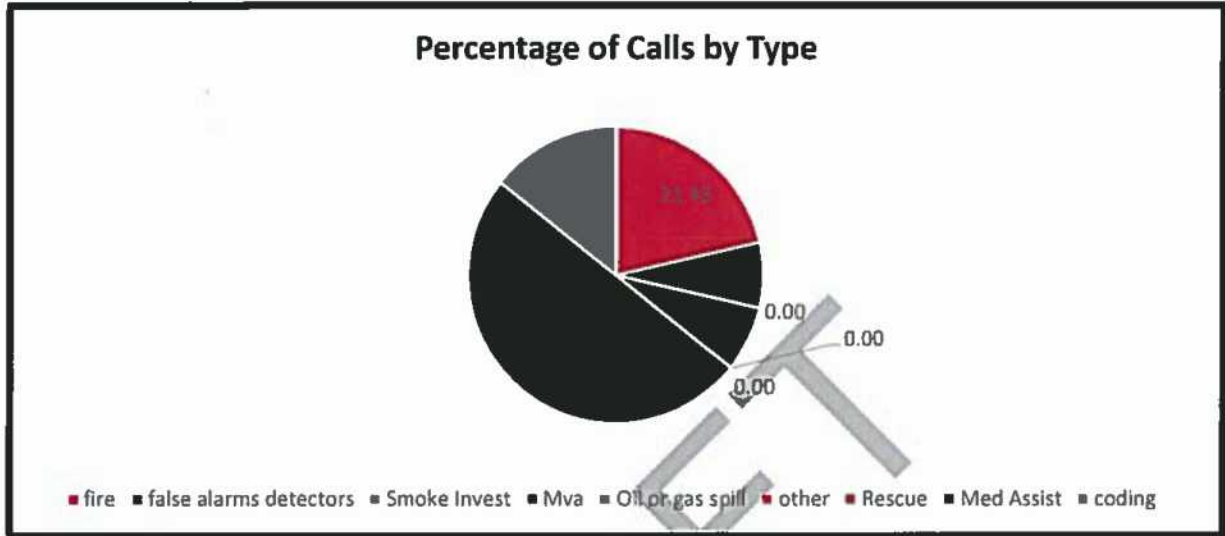
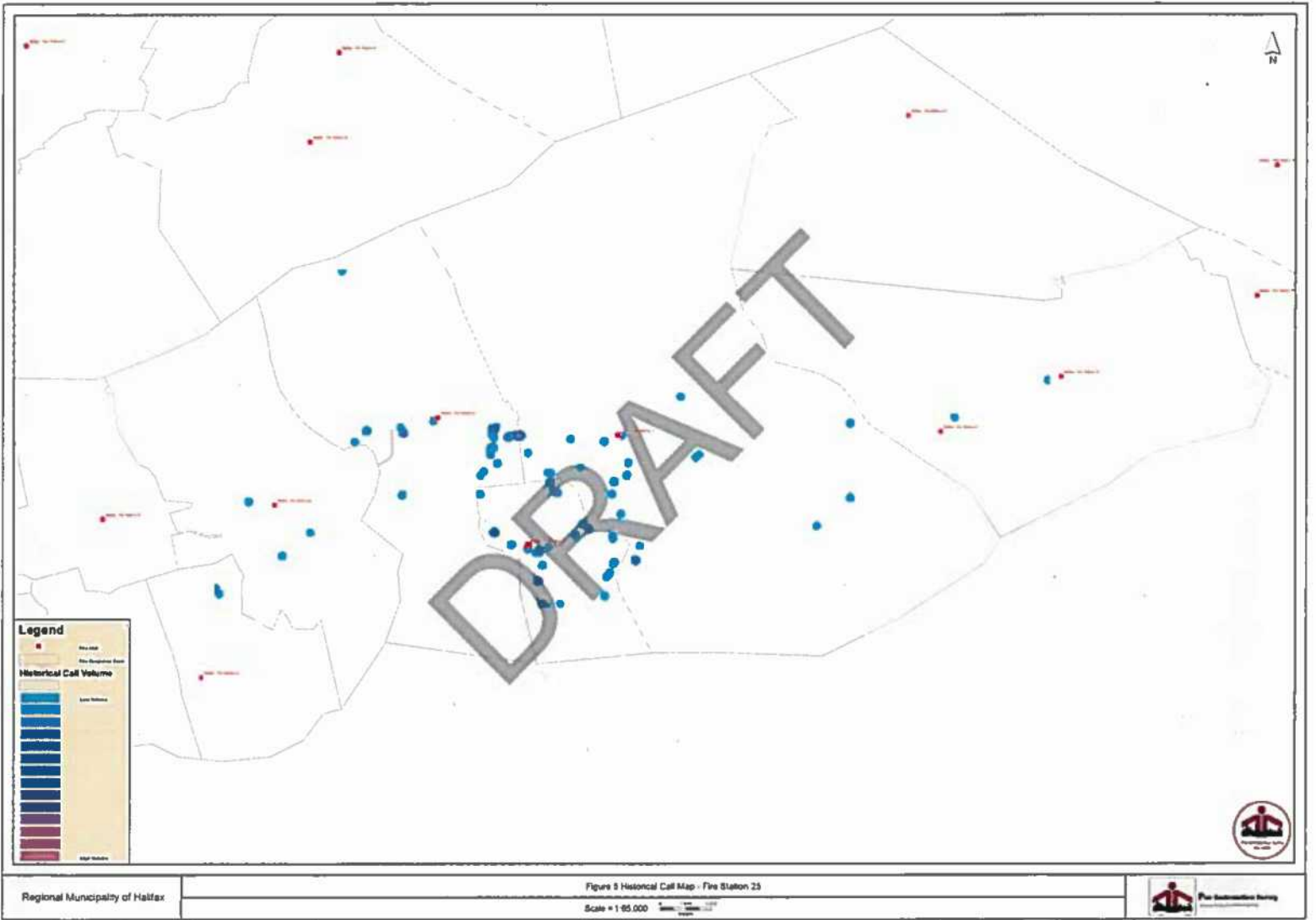


Table 4 is a breakdown of the fire calls by time of day for Station 25. The bulk of the calls are daytime responses in this area.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	6	23.1%
Daytime	0700 – 1659	14	53.8%
Evening	1700 – 2359	6	23.1%





Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 25 was assigned a Public Fire Protection Classification of 10 and Dwelling Protection Grade 5.

Recommendations

- Close Station 25. The number of volunteer firefighters at Station 25 is well below the minimum staffing requirements of 15 volunteer fire fighters for response to the risks in this area and for fire insurance grading purposes. In addition the apparatus at this station does not meet the requirements as determined by the Basic Fire Flow in the response zone. Due to staffing and apparatus deficiencies, the station response is not recognized for fire insurance grading. Operating this station therefore presents an undue cost with no corresponding insurance savings. The station is redundant and should be closed.



STATION 26

51 Old Trunk Rd, Oyster Pond



Station 26 is located in the community of Oyster Pond on the Eastern Shore of the HRM, off of Old Trunk Road. Figure 1 shows the current 2.5 km, 5 km and 8 km response coverage area for Station 26. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area (5 km coverage) represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area (8 km coverage) represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by 16 volunteer fire fighters and houses a Rescue Engine, one Tanker, a Rescue boat and Tow vehicle.

Building and Tarmac

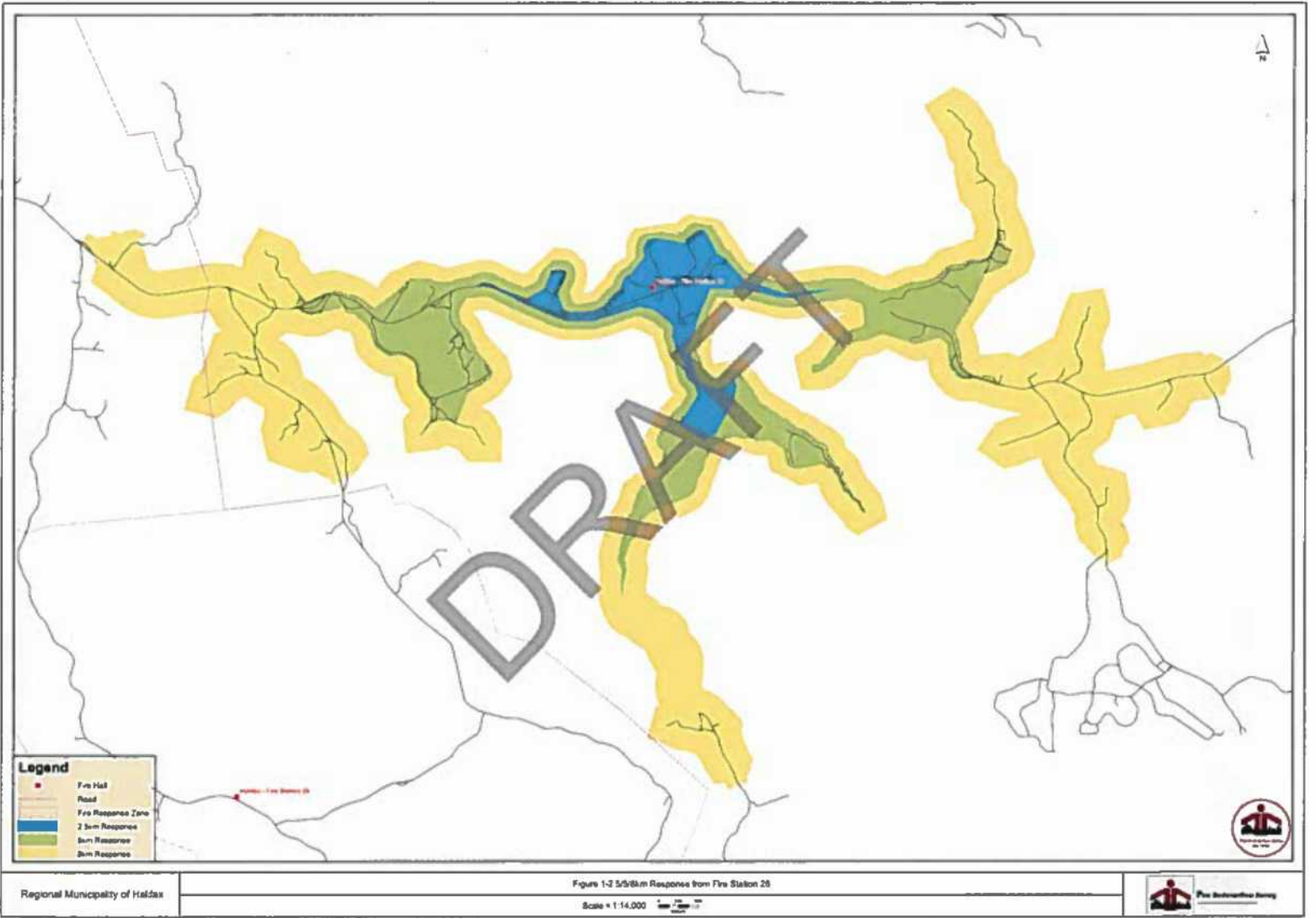
Station 26 is a wood-framed building with three apparatus bays. The station can adequately house the apparatus assigned to it.



The tarmac outside the station is asphalt covered area which extends from the bay door outward. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

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Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities in Station 26 are adequate to meet the needs of the current volunteer staff. However, if an E-platoon is assigned to this station, modifications would be required in some areas of the station to accommodate full-time staff.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

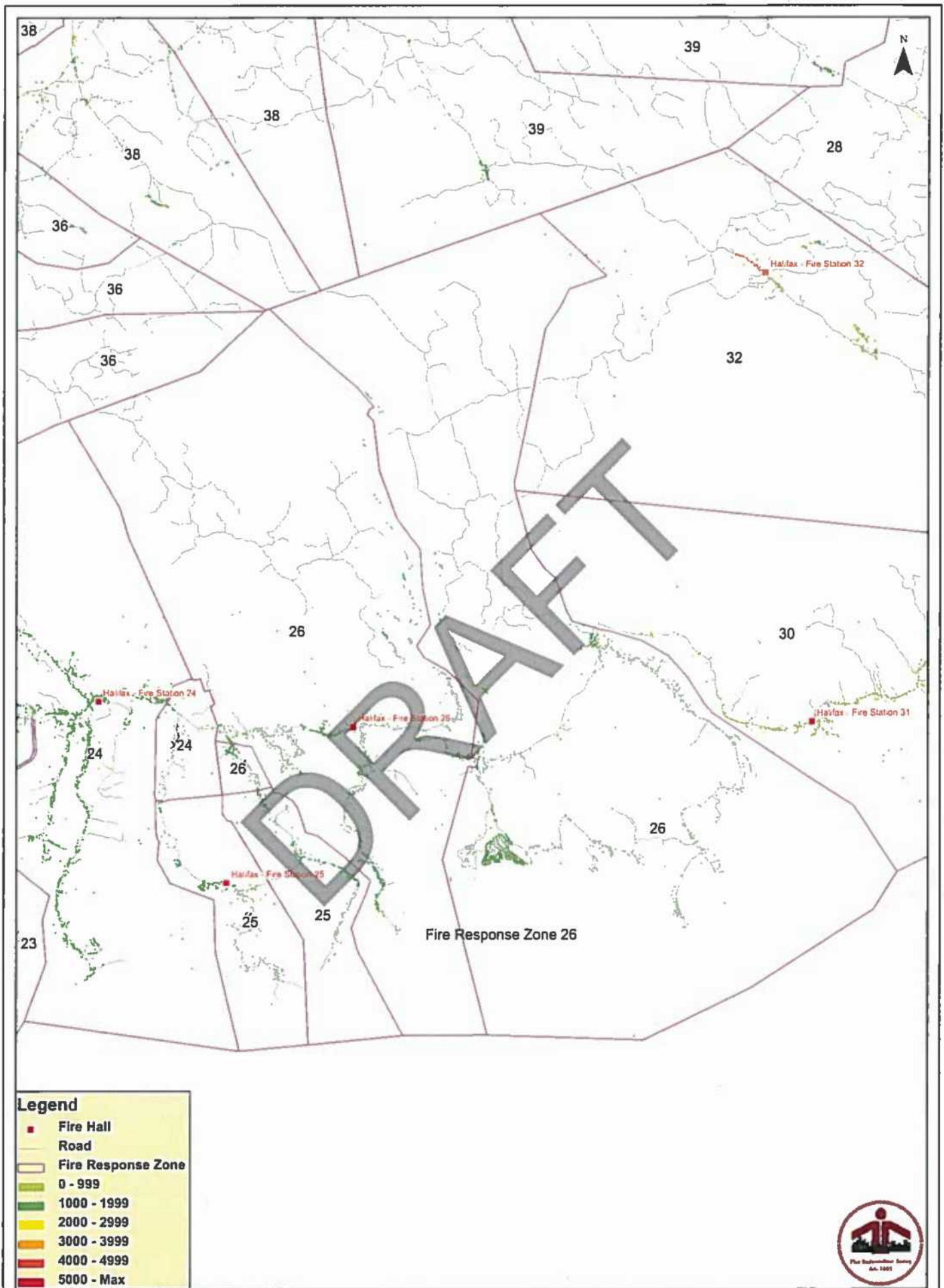
Community Risk Profile – Response Zone

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 1,895 Required Fire Flows were calculated for Response Zone 26 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 26

RFF Range	No. of RFF points
0-999 IGPM	193
1,000-1,999 IGPM	1,695
2,000-2,999 IGPM	7
3,000-3,999 IGPM	0
4,000-4,999 IGPM	0
>=5,000 IGPM	0





The Basic Fire Flows assigned for Station 26 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response zone 26 is based on the 95th percentile which is 1,200 imperial gallons per minute.

Table 2 Basic Fire Flows for HRM Response Zone 26

Total RFF Points	1,895	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,200	90.96
Max	2,900	219.82
5th highest	2,300	174.34

Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 26 is one Engine apparatus. Station 26 is equipped with one Engine. Standard staffing for Station 26 is 16 volunteers, which allows the station to meet the minimum initial response of four to six fire fighters available to respond on first alarms.

Fire Calls

In the period from January 2010 until September 2013, Station 26 responded to 394 emergency calls with the following breakdown as shown in Table 3 and Figure 3 and 4 below. The year average was calculated for all calls over the 45 months reviewed. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls that could not be identified. The primary response for this station was Medical calls at 60.6% of the total call volume.



Table 3 Emergency calls by Incident Type

Call by type			
Type	Total	Year Average	Percentage (%)
Fire	54	14	13.64
False alarm	29	8	7.32
Smoke	11	3	2.78
Motor Vehicle Accident	24	6	6.06
Oil or Gas spill	0	0	0.00
Other	7	2	1.77
Rescue	6	2	1.52
Medical Assist	240	64	60.61
Coding	25	7	6.30

Figure 3 Emergency Calls by Incident Type (2010-2013)

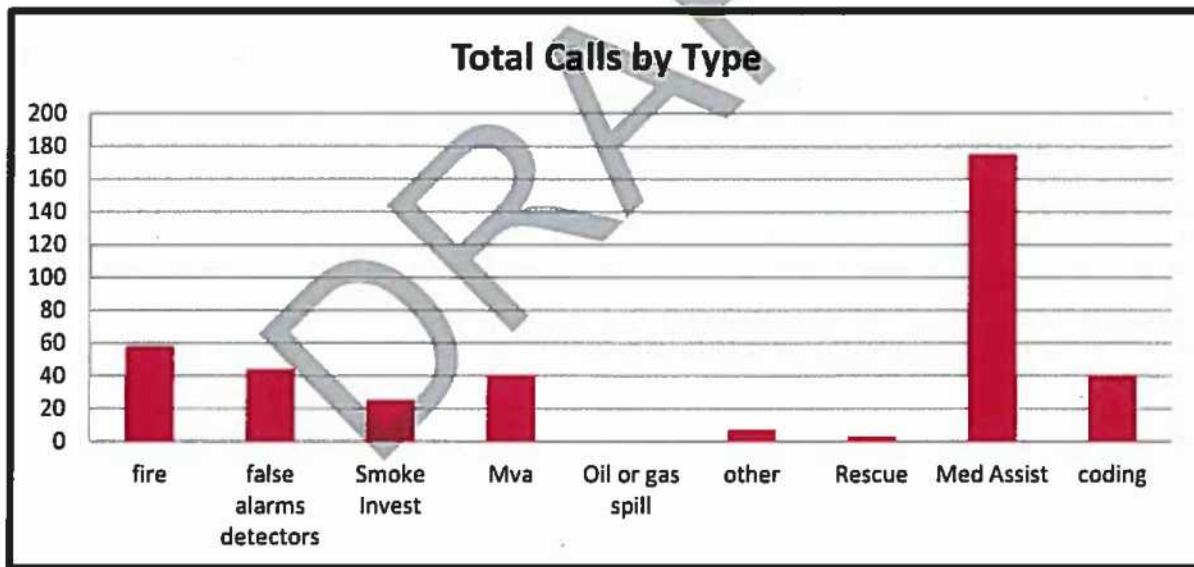


Figure 4 Percentage of Calls by Incident Type (2010-2013)

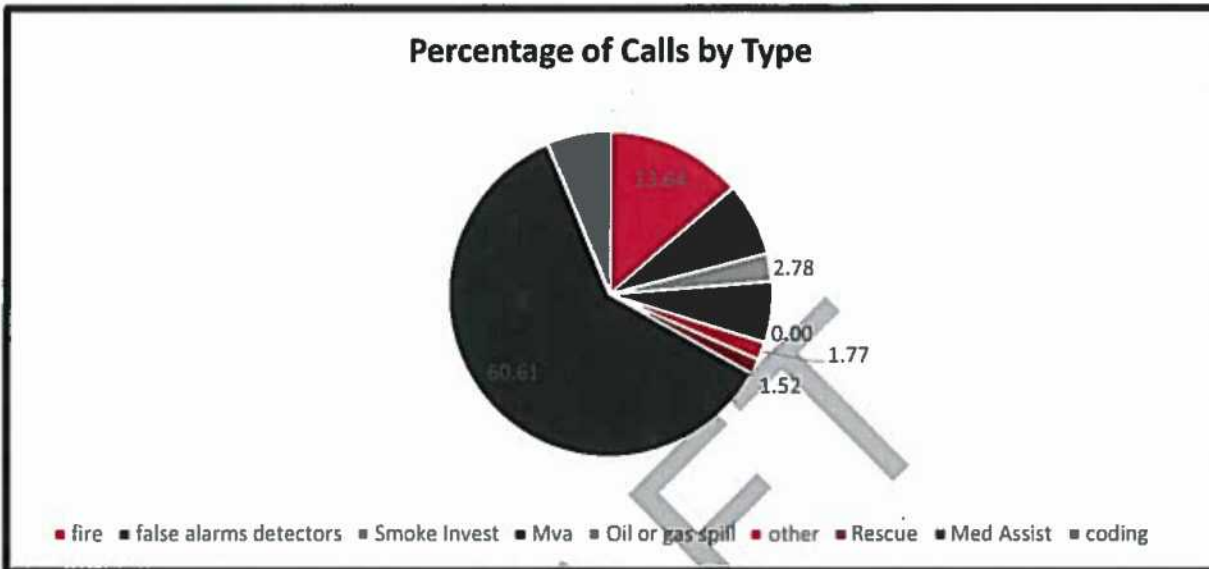
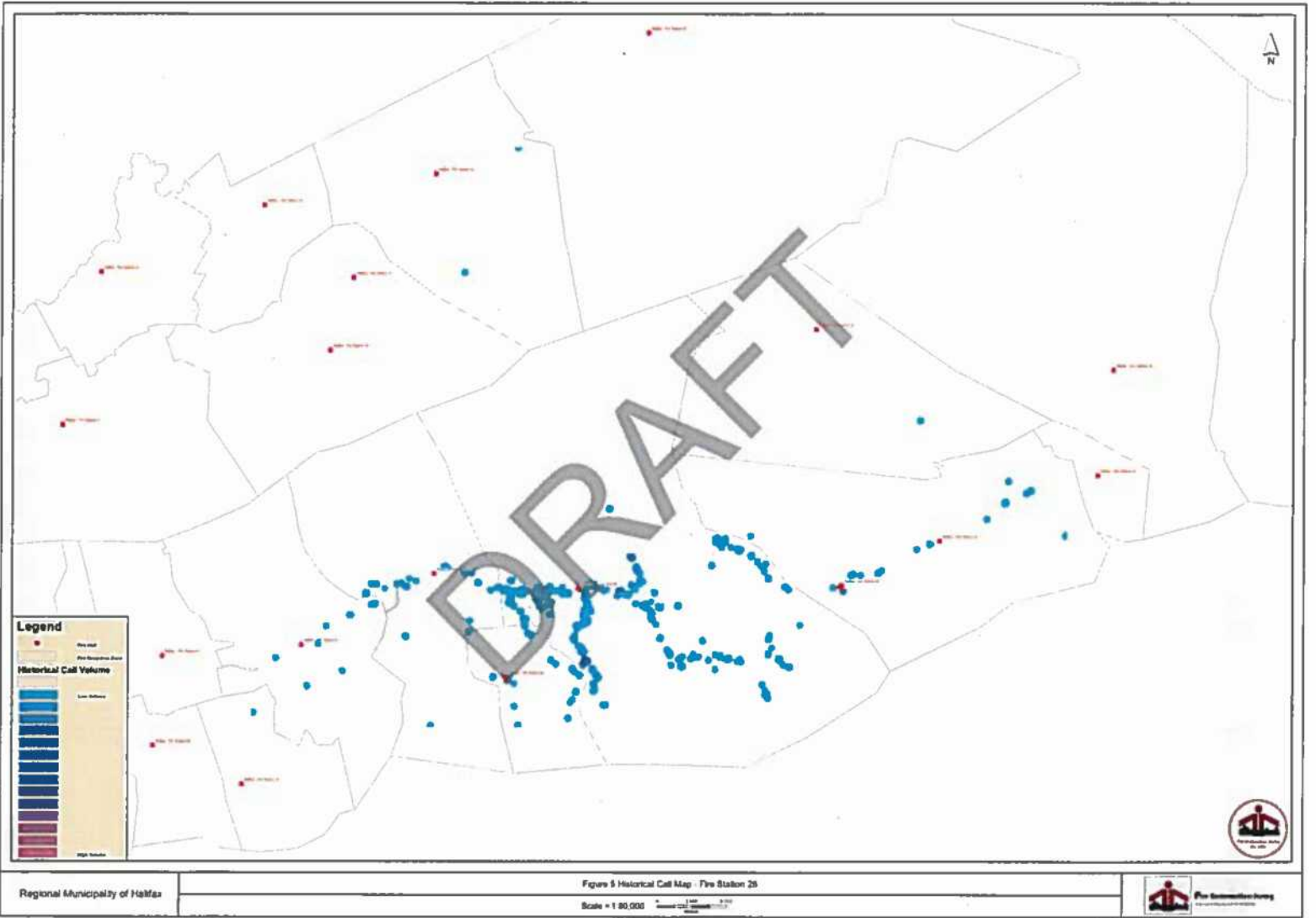


Table 4 is a breakdown of the fire calls by time of day for Station 26. The total number of calls in Table 4 does not include calls whereby the apparatus returned to the station or those for which the type of call could not be identified. The bulk of the calls are daytime and evening responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available. It is recommended that an E – Platoon be assigned to this station to improve daytime response.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	50	13.4%
Daytime	0700 – 1659	175	46.9%
Evening	1700 – 2359	148	39.7%





Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 26 was assigned a Public Fire Protection Classification of 8 and Dwelling Protection Grade 3B.

Recommendations

- Assign an E-platoon to Station 26 in the near future. This will require upgrading to the current facilities in the building to accommodate full-time staff. An effort should be made to increase the current roster of 16 volunteers to a minimum of 20 firefighters allowing Station 26 to remain as an active volunteer station during evening and night time hours.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 28
22835 Highway 7, Sheet Harbour



Station 28 is located in the community of Sheet Harbour in the HRM, off of Highway 7. Figure 1 shows the current 2.5 km, 5 km and 8 km response coverage area for Station 28. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area (5 km coverage) represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area (8 km coverage) represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by 18 volunteer fire fighters and houses an Engine, one Tanker, and a Rescue vehicle.



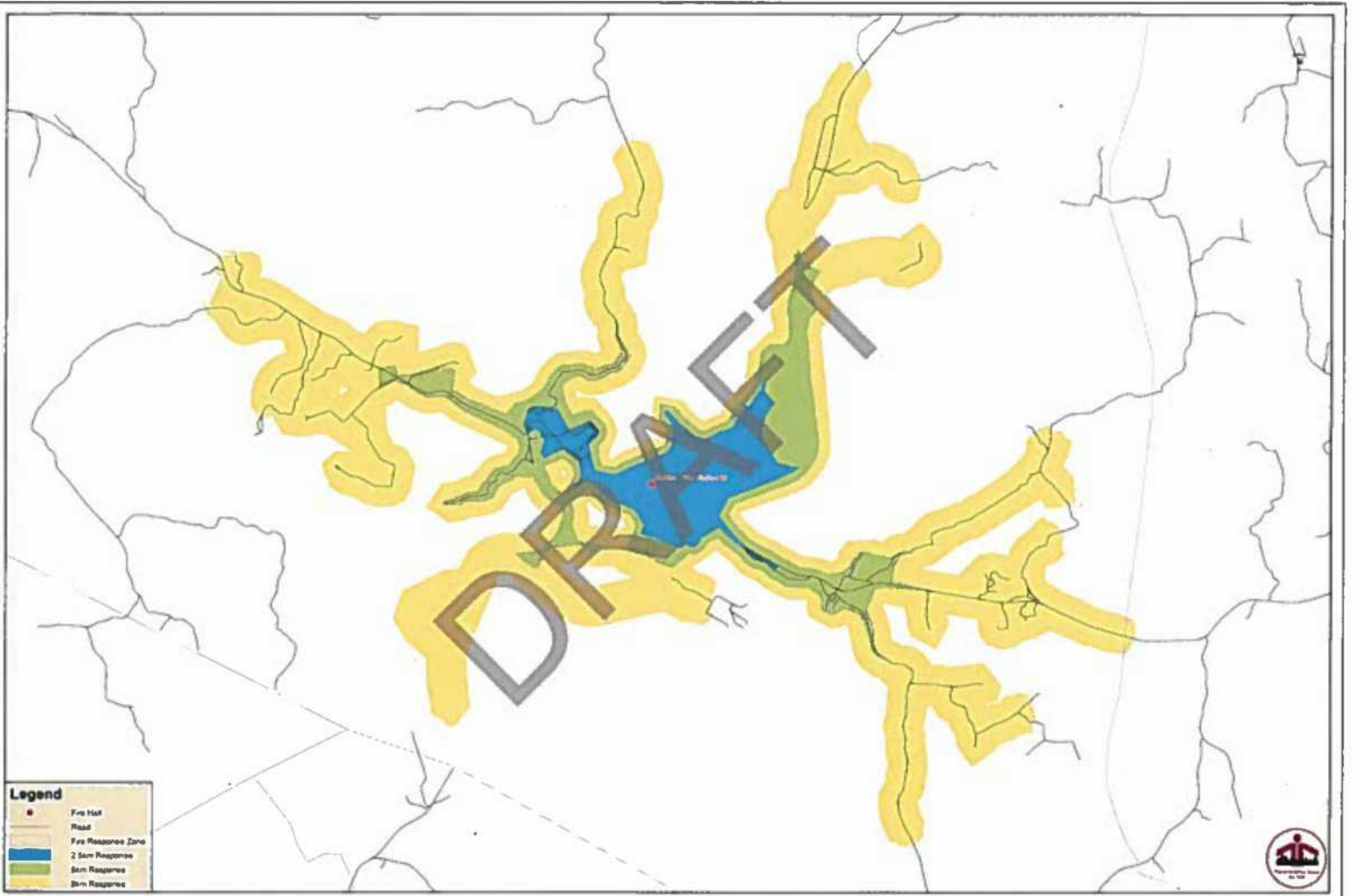
Building and Tarmac

The station construction is composed of metal cladding, concrete block and masonry units. The station has four apparatus bays which can adequately house the apparatus assigned to it.

The tarmac outside the station is a gravel covered area which extends from the bay door outward. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

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Legend

- Fire Hall
- Road
- Fire Response Zone
- 2 km Response
- 5 km Response
- 8 km Response



Regional Municipality of Halifax

Figure 1 - 2.55/8km Response from Fire Station 28

Scale = 1:17,000



Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities in Station 28 are adequate to meet the needs of the fire fighters.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

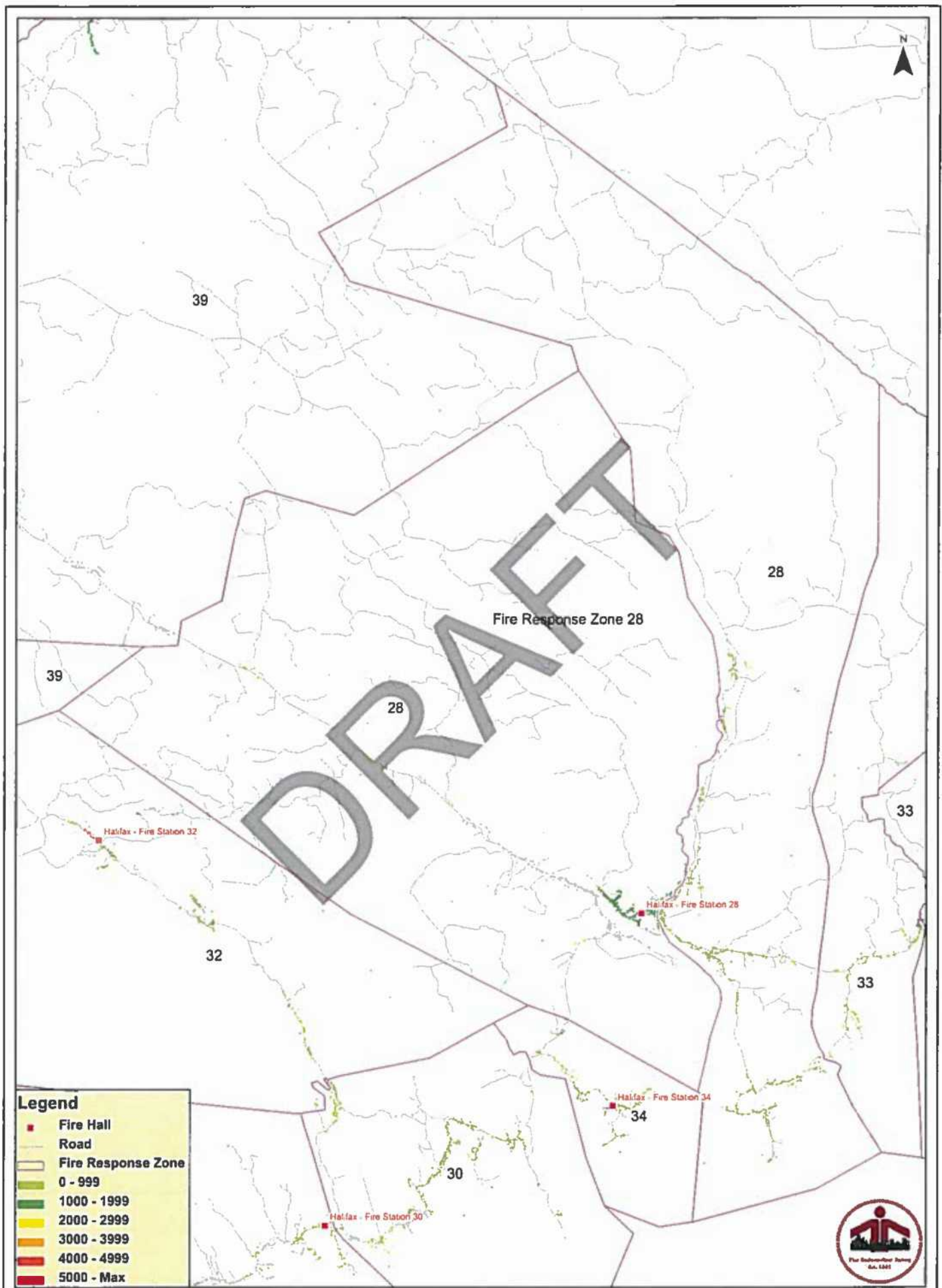
Community Risk Profile – Response Zone

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 958 Required Fire Flows were calculated for Response Zone 28 as shown geographically in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 28

RFF Range	No. of RFF points
0-999 IGPM	428
1,000-1,999 IGPM	515
2,000-2,999 IGPM	8
3,000-3,999 IGPM	7
4,000-4,999 IGPM	0
>=5,000 IGPM	0





The Basic Fire Flows assigned for Station 28 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile or the 5th highest RFF in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited to large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response zone 28 is based on the 95th percentile which is 1,200 imperial gallons per minute.

Table 2 Basic Fire Flows for HRM Response Zone 28

Total RFF Points	958	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,200	90.96
Max	3,900	295.62
5th highest	3,300	250.14

Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 28 is one Engine apparatus. Station 28 is equipped with one Engine. Standard staffing for Station 28 is 18 volunteers, which allows the station to meet the minimum initial response of four to six fire fighters available to respond on first alarms.

Fire Calls

In the period from January 2010 until September 2013 Station 28 received a total of 241 emergency calls with the following breakdown as described in Table 3 and Figure 4 and 5 below. The year average was calculated for all calls over the 45 months reviewed. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls that could not be identified. The primary response for this station was Medical calls at 52.7% of the total call volume.



Table 3 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Ave	Percentage (%)
Fire	38	10	15.77
False alarm	19	5	7.88
Smoke	8	2	3.32
Motor Vehicle Accident	14	4	5.81
Oil or Gas spill	0	0	0.00
Other	9	2	3.73
Rescue	2	0.5	0.83
Medical Assist	127	34	52.70
Coding	24	6	9.96

Figure 3 Emergency Calls by Incident Type (2010-2013)

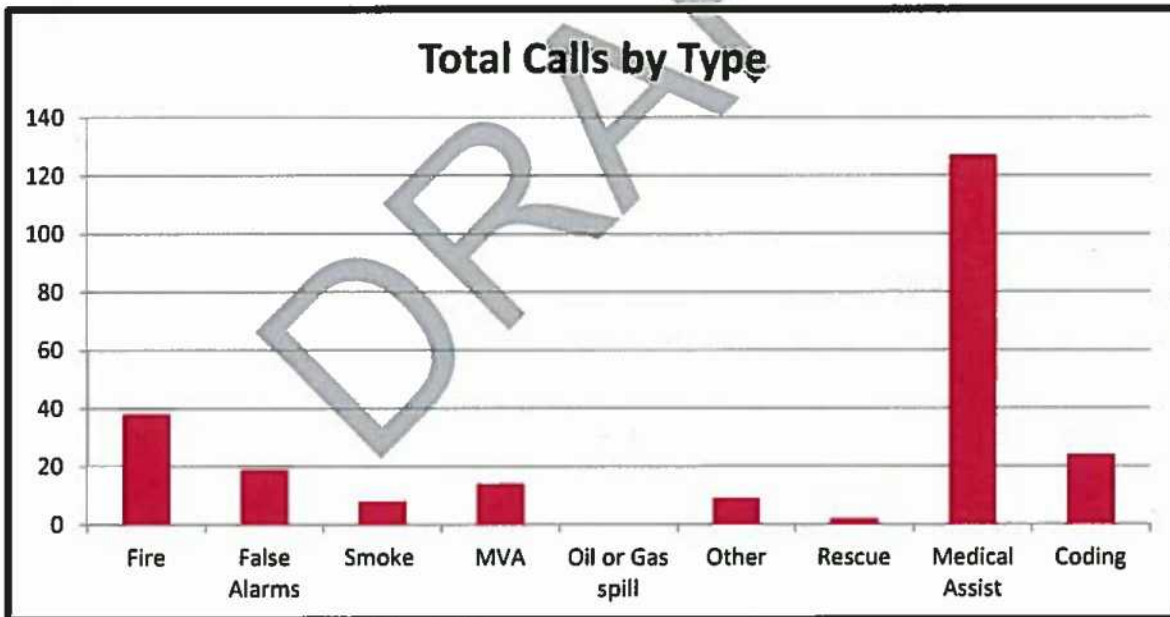


Figure 4 Percentage of Calls by Incident Type (2010-2013)

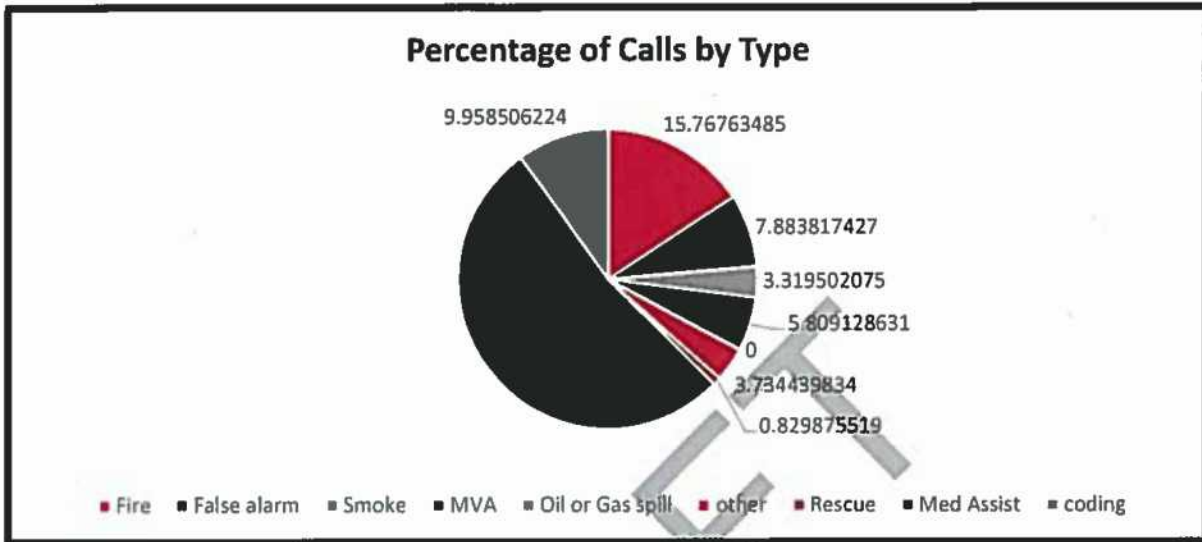


Table 4 is a breakdown of the fire calls by time of day for Station 28. The bulk of the calls are daytime and evening responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available.

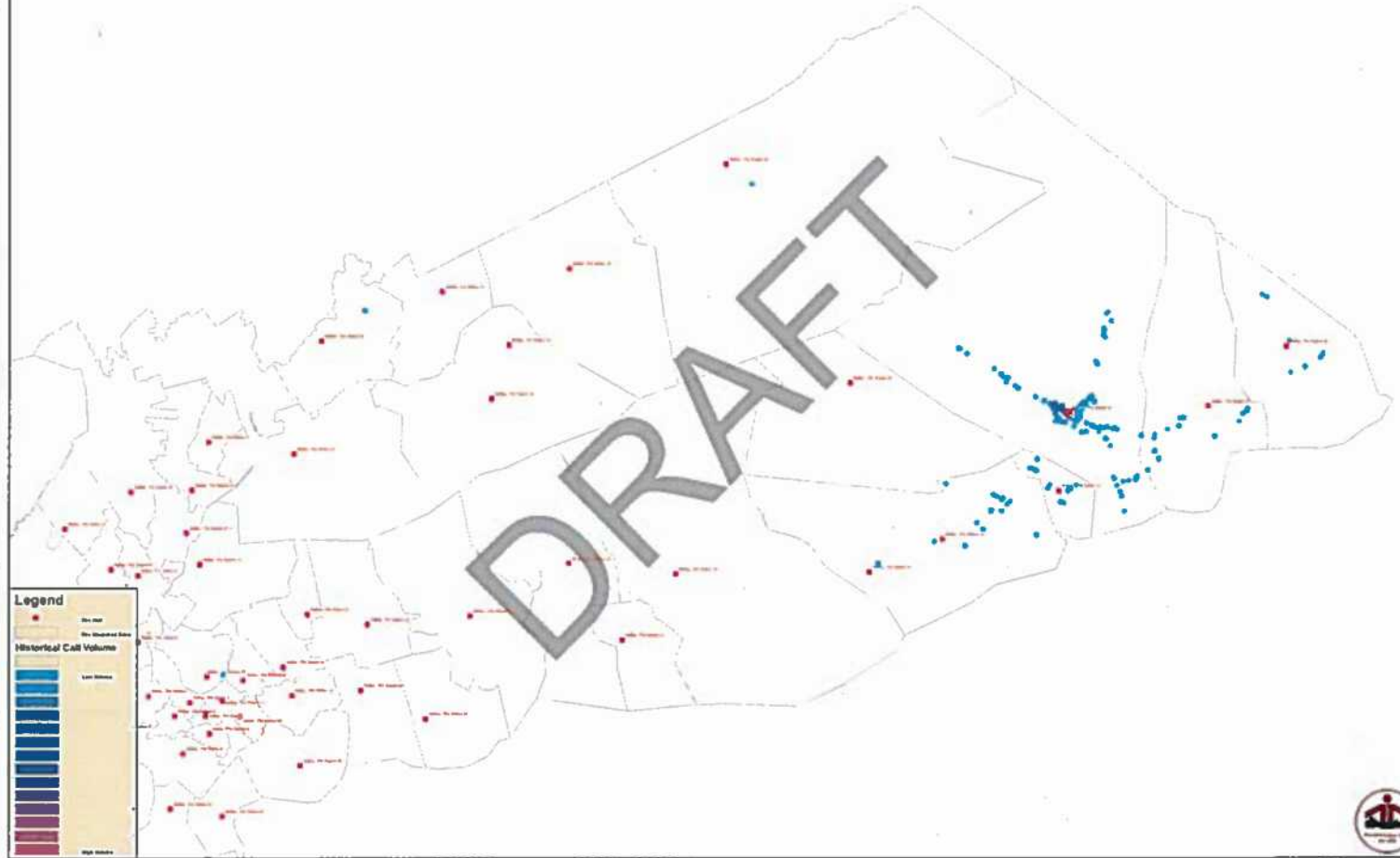
Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	42	17.4%
Daytime	0700 – 1659	101	41.9%
Evening	1700 – 2359	98	40.7%





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Legend

- Fire Station
- Historical Call Volume

Low Volume

High Volume



Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 28 was assigned a Public Fire Protection Classification of 8 and Dwelling Protection Grade 3B.

Recommendations

- It is recommended that an E-platoon be assigned to Station 28. There are a large number of daytime calls to this station (42% of total calls) and therefore an E-platoon is required to improve the daytime response.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 29

28975 Highway 7, Moser River



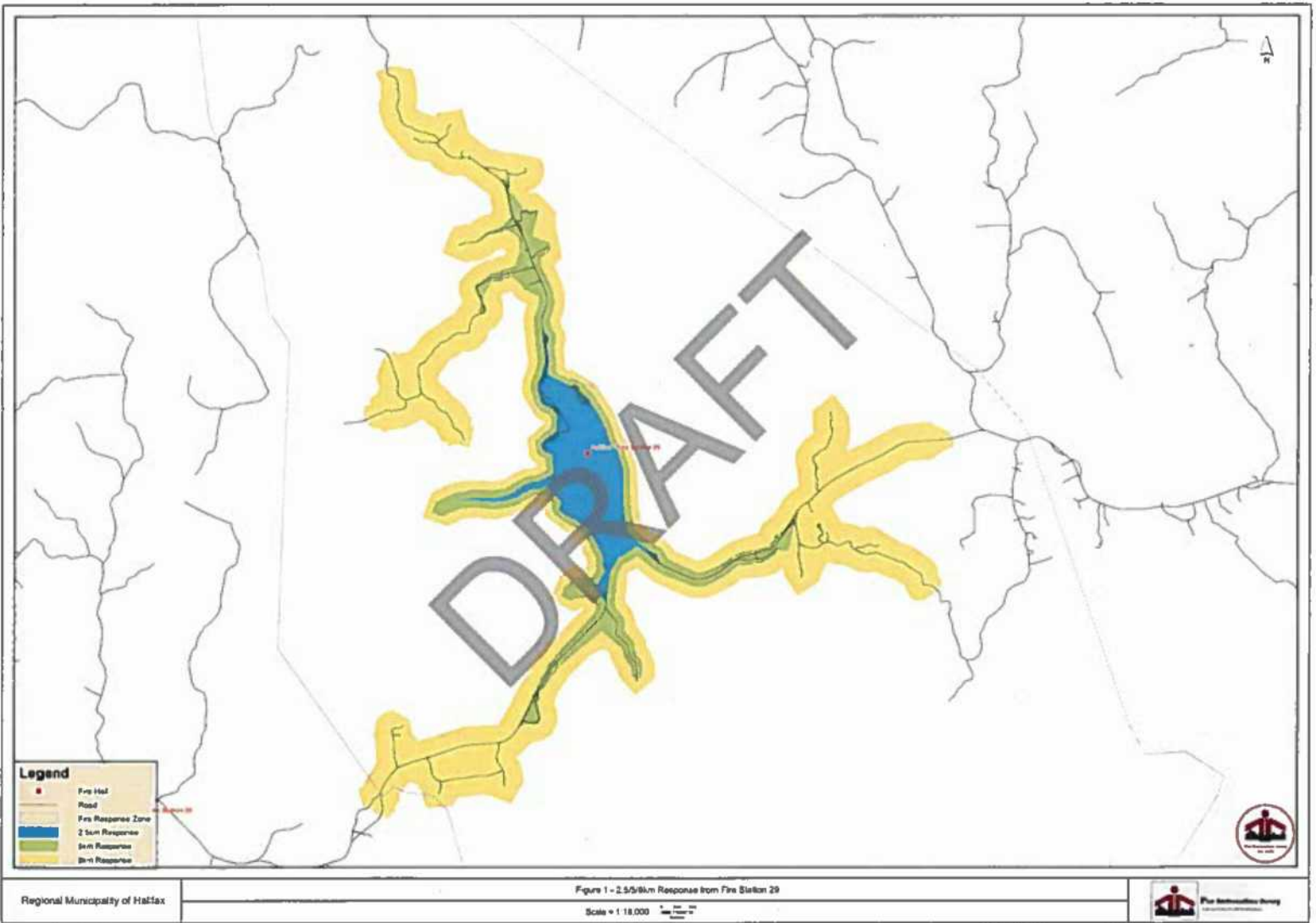
Station 29 is located in the community of Moser River in the eastern part of HRM, off of Highway 7. Figure 1 shows the current 2.5 km, 5 km and 8 km response coverage area for Station 29. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area (5 km coverage) represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area (8 km coverage) represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by 8 volunteer fire fighters and houses an Engine and one Tanker.

Building and Tarmac

The station construction is metal clad, concrete block and masonry units with four apparatus bays. The station can adequately house the apparatus assigned to it. The tarmac outside the station is an asphalt covered area which extends from the bay door outward. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.





Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities in Station 29 are adequate to meet the needs of the fire fighters.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

Community Risk Profile – Response Zone

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 447 Required Fire Flows were calculated for Response Zone 29 as shown in Figure 2 below.

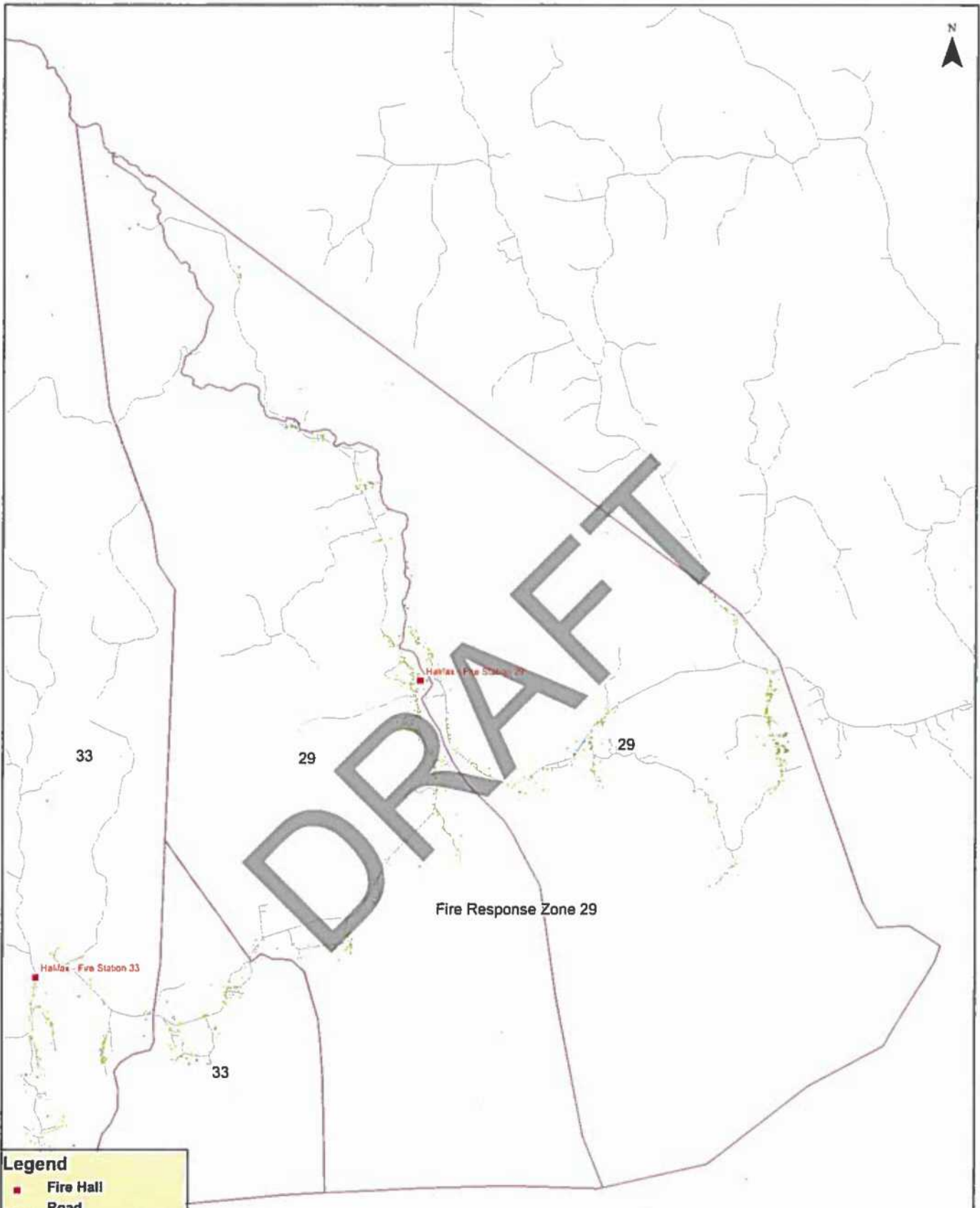
Table 1 Required Fire Flow ranges in Response Zone 29

RFF Range	No. of RFF points
0-999 IGPM	373
1,000-1,999 IGPM	74
2,000-2,999 IGPM	0
3,000-3,999 IGPM	0
4,000-4,999 IGPM	0
>=5,000 IGPM	0





DRAFT



Fire Response Zone 29

Legend

-  Fire Hall
-  Road
-  Fire Response Zone
-  0 - 999
-  1000 - 1999
-  2000 - 2999
-  3000 - 3999
-  4000 - 4999
-  5000 - Max



The Basic Fire Flows assigned for Station 29 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response zone 29 is based on the 95th percentile which is 1,200 imperial gallons per minute.

Table 2 Basic Fire Flows for HRM Response Zone 29

Total RFF Points	447	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,200	90.96
Max	1,700	128.86
5th highest	1,200	90.96

Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 29 is one Engine apparatus. Station 29 is equipped with one Engine. Standard staffing for Station 29 is 8 volunteers, which is well below the minimum of 15 volunteers or four to six full-time staff required on a fire department roster to provide adequate response and be recognized for fire insurance grading purposes.

Fire Calls

In the period from January 2010 until September 2013 Station 29, received 97 emergency calls with the following breakdown as described in Table 3 and Figure 4 and 5 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls could not be identified.

The majority of calls to Station 29 were Medical emergencies at 54.6 percent of the total call volume.



Table 3 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year Ave	Percentage (%)
Fire	32	9	32.99
False alarm	2	0.5	2.06
Smoke	0	0	0.00
Motor Vehicle Accident	4	1	4.12
Oil or Gas spill	0	0	0.00
Other	4	1	4.12
Rescue	0	0	0.00
Medical Assist	53	14	54.64
Coding	2	0.5	2.07

Figure 3 Emergency Calls by Incident Type (2010-2013)

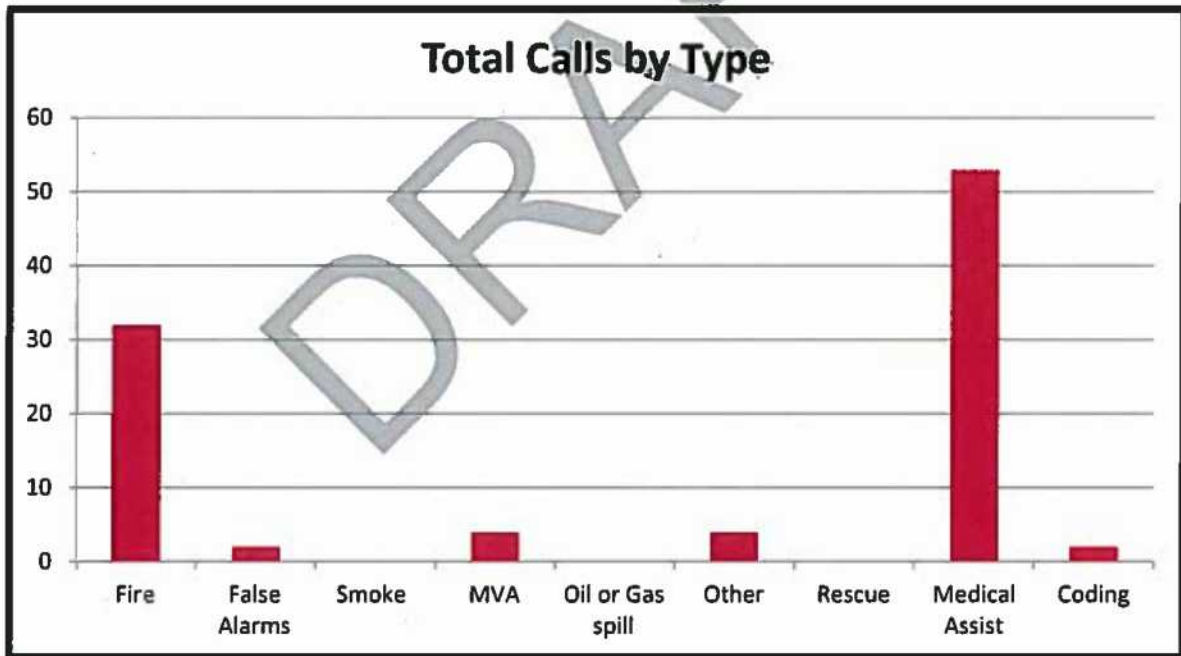


Figure 4 Percentage of Calls by Incident Type (2010-2013)

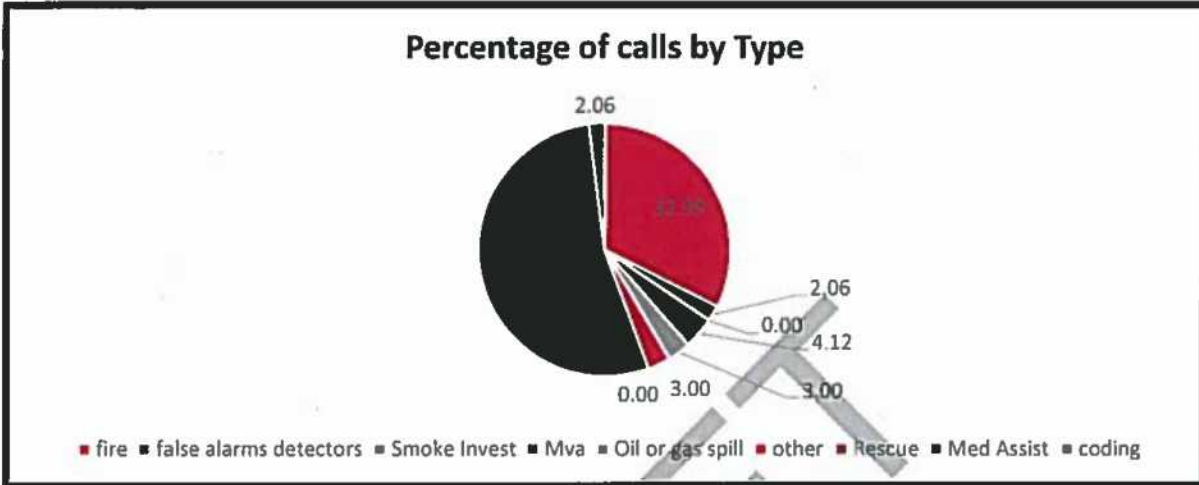
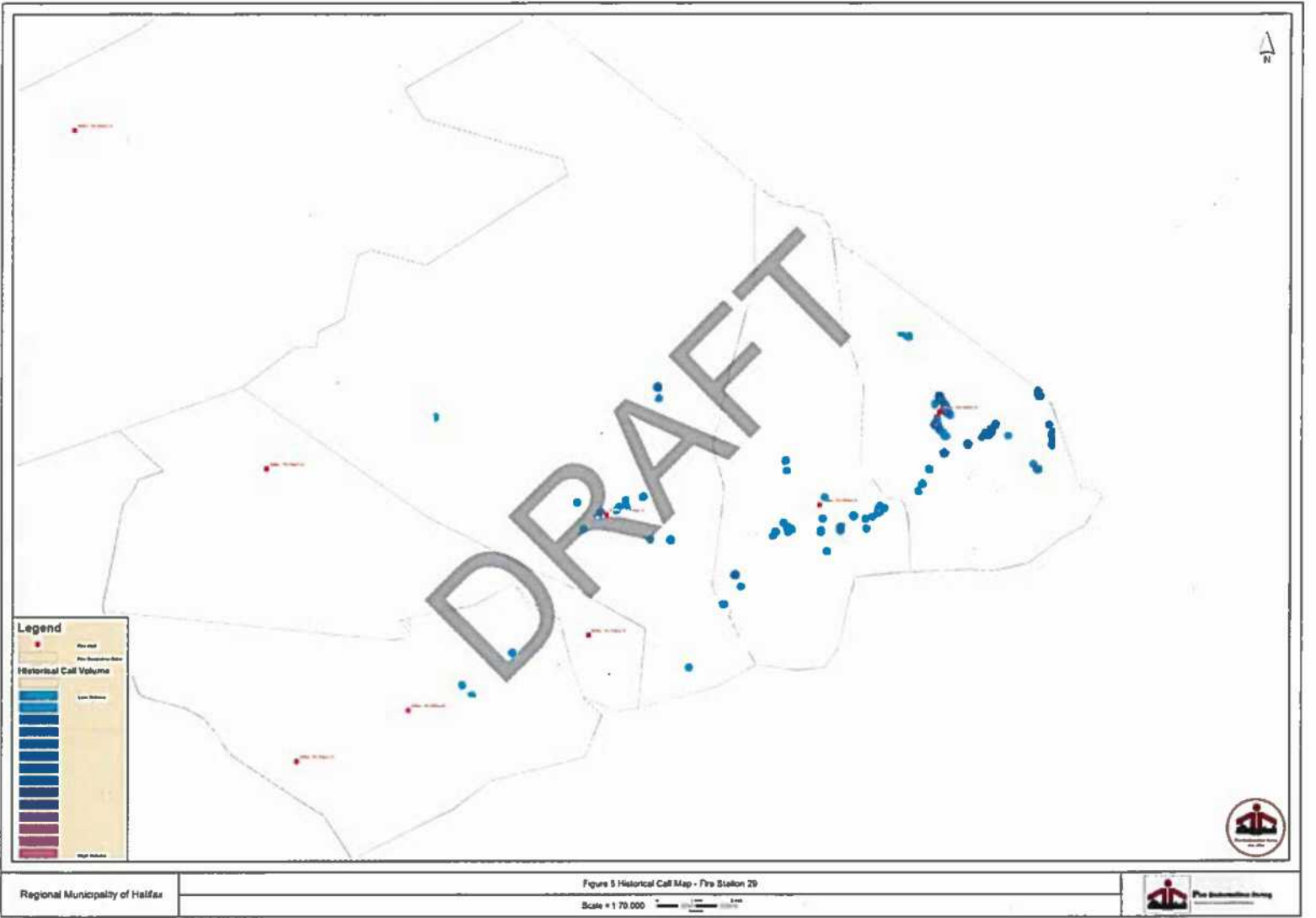


Table 4 is a breakdown of the fire calls by time of day for Station 29. The bulk of the calls are daytime and evening responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	13	13.4%
Daytime	0700 – 1659	47	48.5%
Evening	1700 – 2359	37	38.1%





Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 29 was assigned a Public Fire Protection Classification of 10 and Dwelling Protection Grade 5.

Recommendations

- Increase the number of volunteers at Station 29 to a minimum of 15 volunteers to provide an adequate response and meet the minimum requirements for fire insurance grading recognition.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 30
17559 Highway 7, Tangier



Station 30 is located in the community of Tangier off of Highway 7. Figure 1 shows the current 2.5 km, 5 km and 8 km response coverage area for Station 30. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

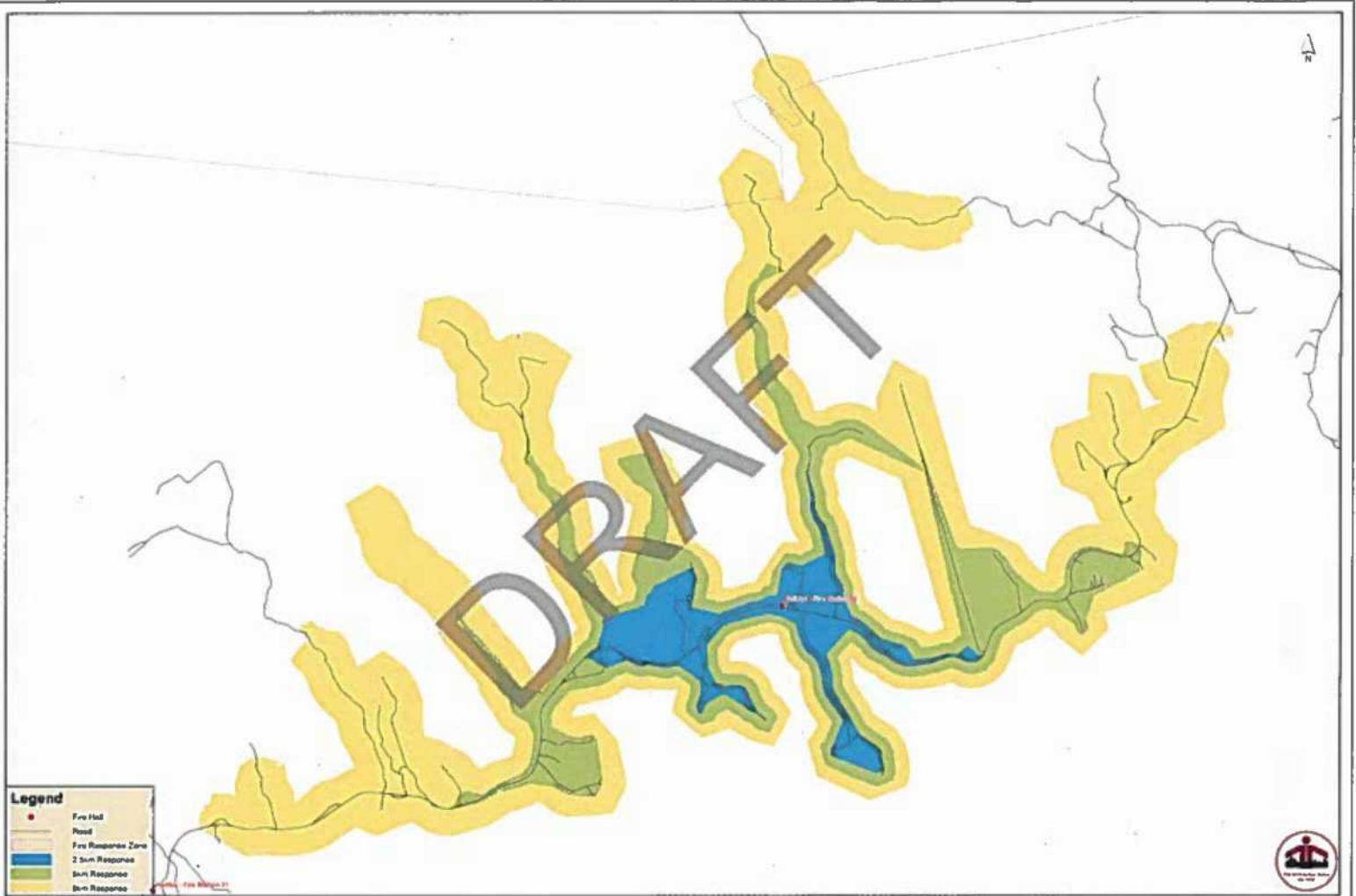
The station is staffed by 13 volunteers and houses an Engine and a Rescue.

Building and Tarmac

The station construction is composed of concrete block and masonry units. The building has four apparatus bays which adequately house the apparatus assigned to the station.

The tarmac outside the station is a gravel area which extends from the bay door outward. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.





Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities in Station 30 are adequate to meet the needs of the fire fighters.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

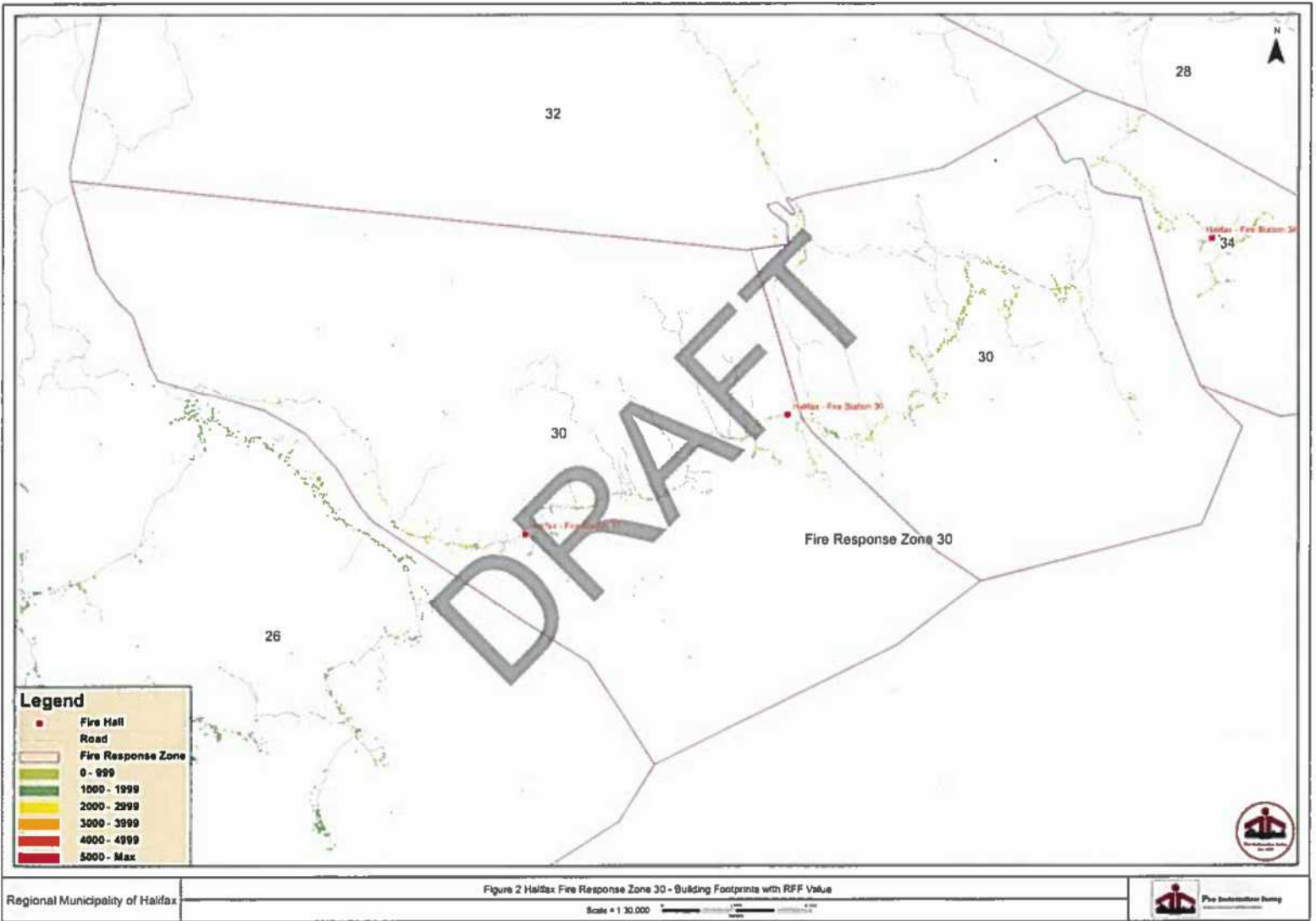
Community Risk Profile – Response Zone 30

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 694 Required Fire Flows were calculated for Response Zone 30 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 30

RFF Range	No. of RFF points
0-999 IGPM	567
1,000-1,999 IGPM	126
2,000-2,999 IGPM	1
3,000-3,999 IGPM	0
4,000-4,999 IGPM	0
>=5,000 IGPM	0





The Basic Fire Flows assigned for Station 30 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for response zone 30 is based on the 95th percentile which is 1,200 imperial gallons per minute.

Table 2 Basic Fire Flows for HRM Response Zone 30

Total RFF Points	694	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,200	90.96
Max	2,500	189.50
5th highest	1,700	128.86

Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 30 is one Engine apparatus. The current apparatus located at Station 30 is an engine and a rescue vehicle, both of which are in good condition and well equipped. Standard staffing for Station 30 is 13 volunteers, which is below the minimum of 15 volunteers or four to six full-time staff required on a fire department roster to provide adequate response and be recognized for fire insurance grading purposes.

Fire Calls

The emergency call data provided includes calls to Station 30 and 31 as calls are paged out to both stations. In the period from January 2010 until September 2013 Station 30 and 31 received a total of 218 emergency calls with the breakdown as described in Table 3 and Figure 4 and 5 below. The year average was calculated for all calls over the 45 months reviewed. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls that could not be identified.

The primary response for the two stations was Medical calls at 65.6% of the total call volume.



Table 3 Emergency calls by Incident Type (Station 30 &31)

Call by type			
Type	Total	Year Average	Percentage (%)
Fire	29	8	13.30
False alarm	7	2	3.21
Smoke	6	2	2.75
Motor Vehicle Accident	16	4	7.34
Oil or Gas spill	1	0	0.46
Other	2	1	0.92
Rescue	0	0	0.00
Medical Assist	143	38	65.60
Coding	14	4	6.42

Figure 3 Emergency Calls by Incident Type – Station 30 & 31 (2010-2013)

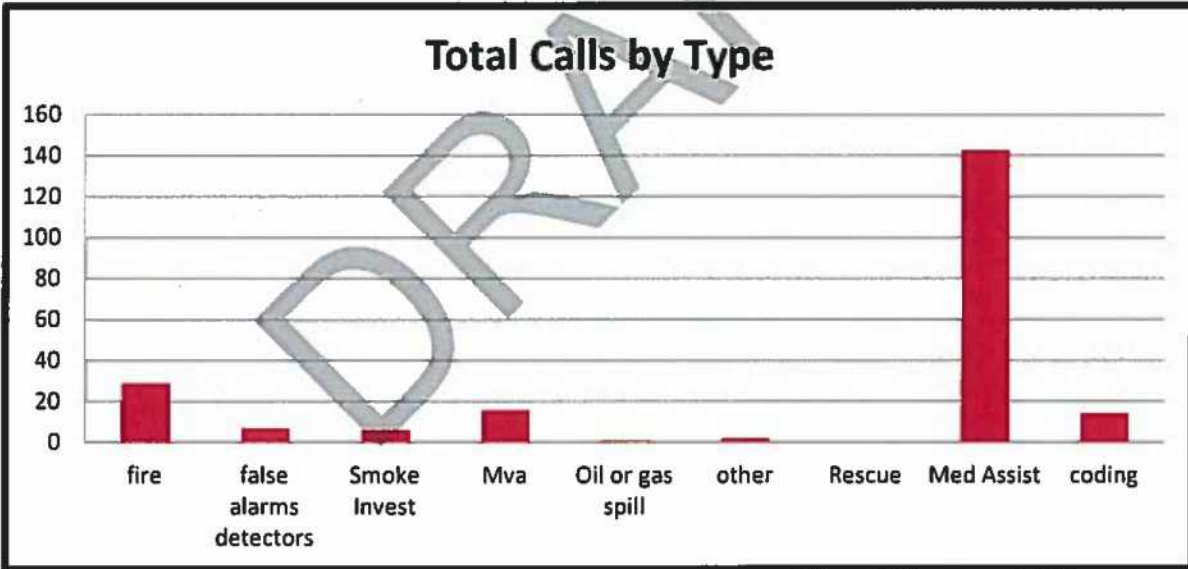


Figure 4 Percentage of Calls by Incident Type – Station 30 & 31 (2010-2013)

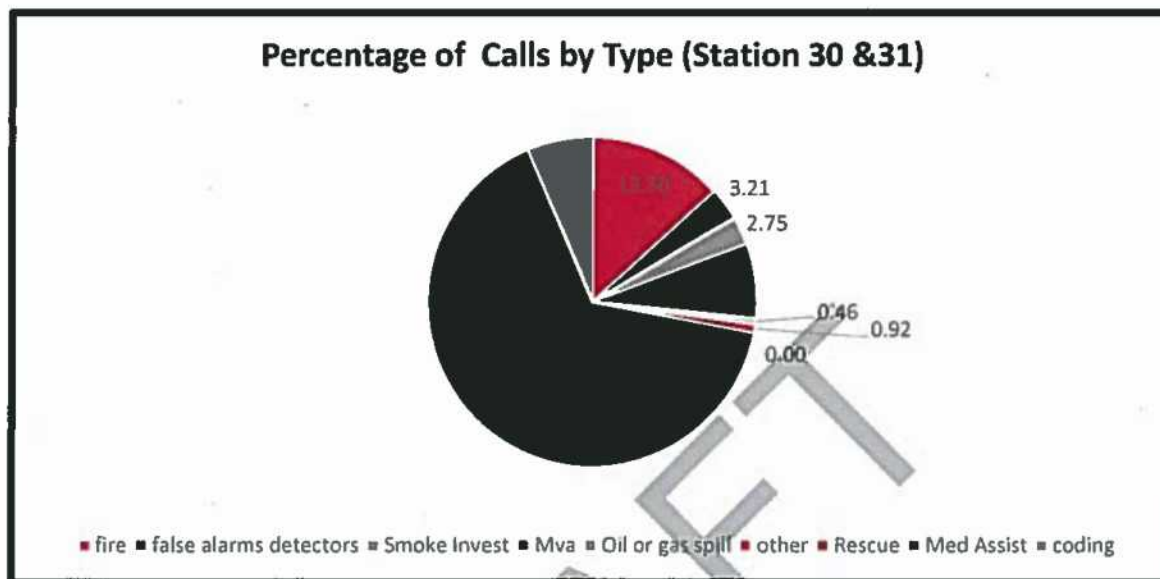
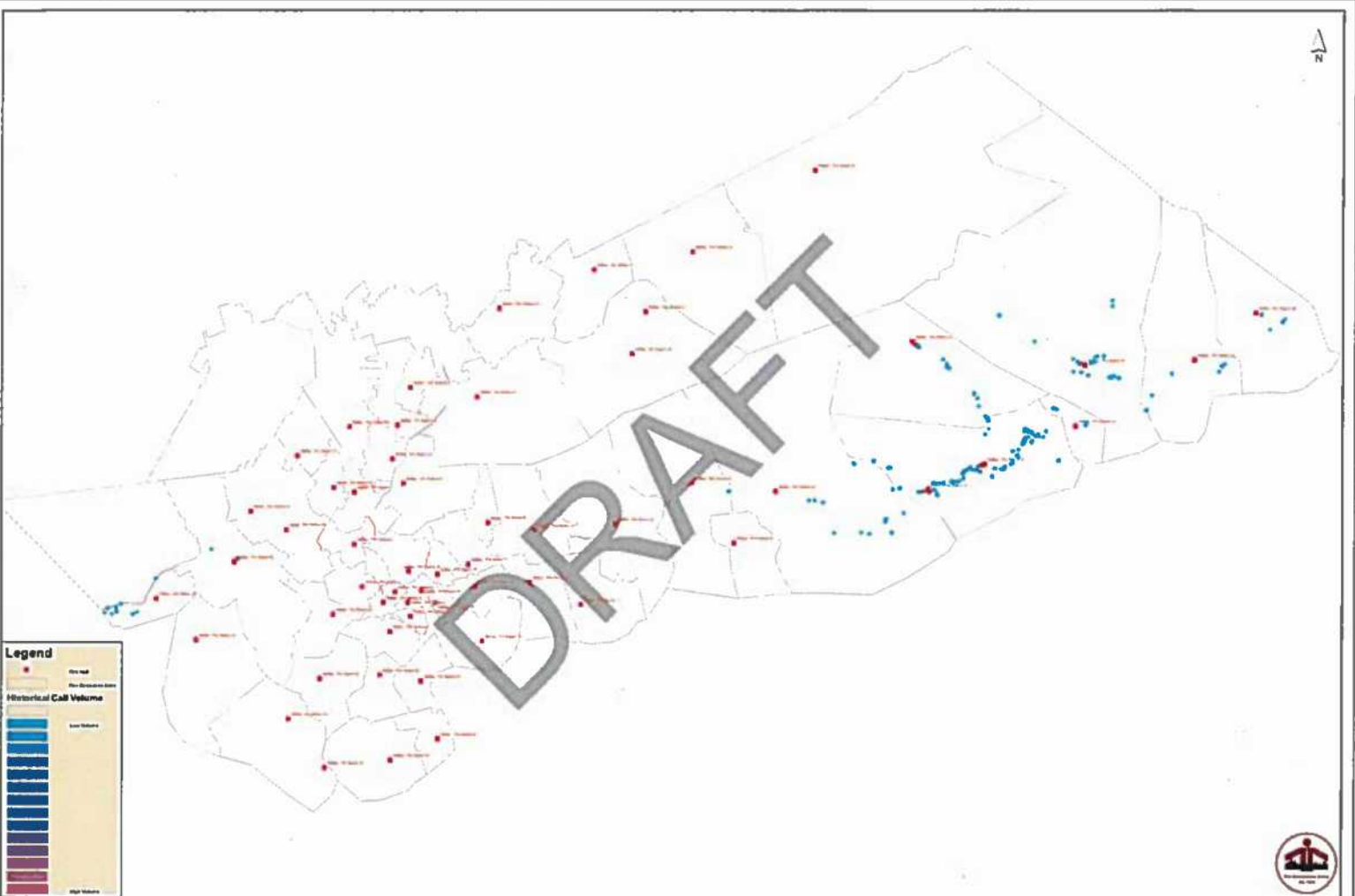


Table 4 is a breakdown of the combined fire calls by time of day for Station 30 and 31. The bulk of the calls are daytime and evening responses in this area.

Table 4 Emergency calls based on time of day (Station 30 & 31)

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	30	13.8%
Daytime	0700 – 1659	117	53.7%
Evening	1700 – 2359	71	32.5%





Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 30 was assigned a Public Fire Protection Classification of 10 and Dwelling Protection Grade 5.

Recommendations

- Close Station 30. The number of volunteer firefighters at Station 30 is below the minimum staffing requirements of 15 volunteer fire fighters for response to the risks in this area and for fire insurance grading purposes. Furthermore, the station receives a limited number of fire calls which does not warrant the addition of daytime staffing. Due to staffing deficiencies, the station response is not recognized for fire insurance grading. Operating this station presents an undue cost with no corresponding insurance savings. The station is therefore redundant and should be closed.



STATION 31

15750 Highway 7, East Ship Harbour



Station 31 is located in the community of East Ship Harbour on Highway 7. Station 31 provides response to communities in the East Ship Harbour in the eastern portion of HRM. Figure 1 shows the current 2.5 km, 5 km and 8 km response coverage area for Station 31. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows. The green area (5 km coverage) represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area (8 km coverage) represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

There are currently no volunteers at this station but the station building houses one Tanker. The tanker is staffed by volunteers from Station 30.

Building and Tarmac

The station building is a Quonset hut with one apparatus bay. Building code violations were noted in the overall layout of the building.



The tarmac outside the station is a gravel area which extends from the bay door outward. The tarmac does not provide sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

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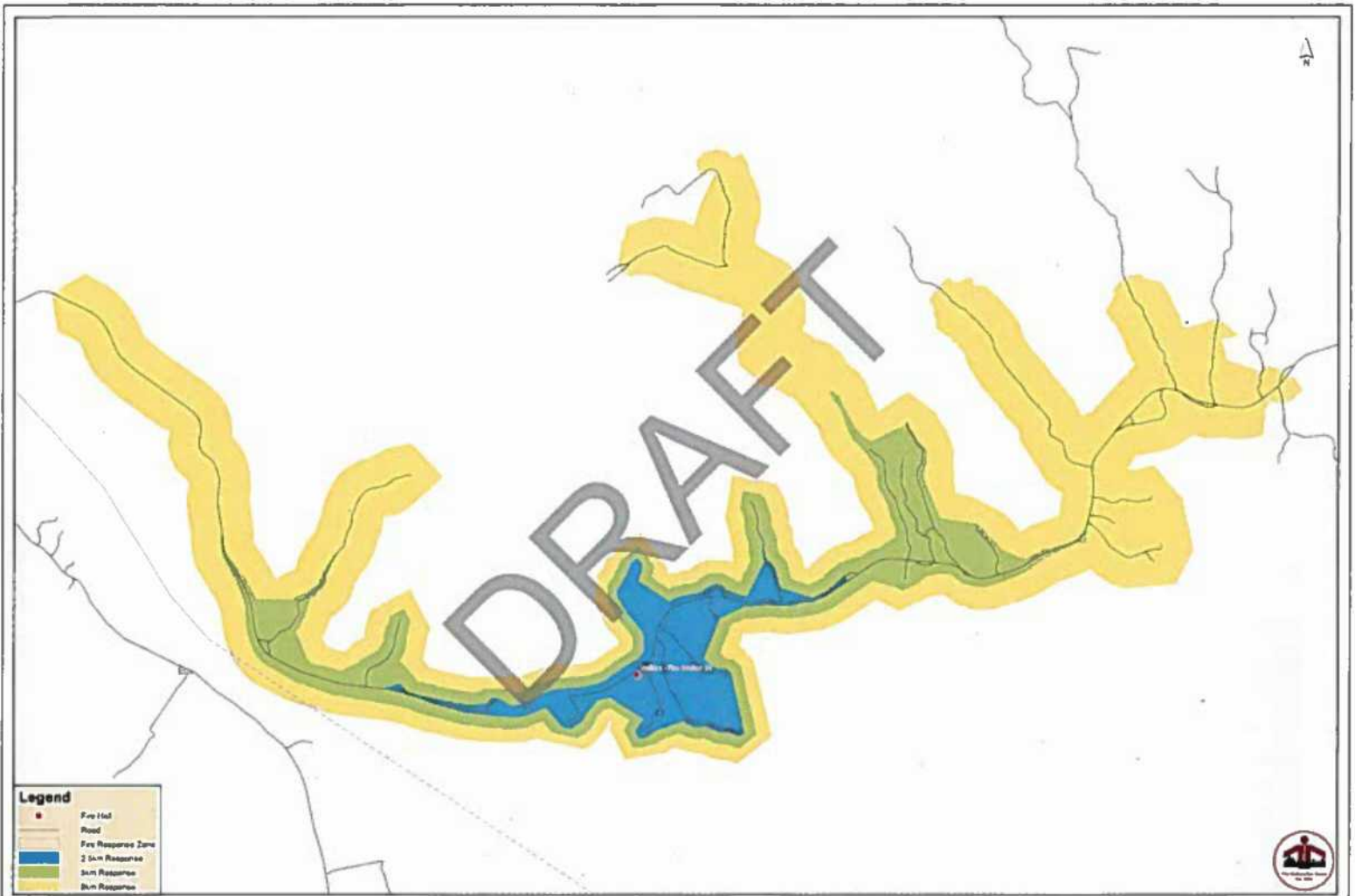


Figure 1 - 2.5/5km Response from Fire Station 31

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities in Station 31 are not adequate to meet the needs of fire fighters.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

Community Risk Profile – Response Zone

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 183 Required Fire Flows were calculated for Response Zone 31.

Table 1 Required Fire Flow ranges in Response Zone 31

RFF Range	No. of RFF points
0-999 IGPM	124
1,000-1,999 IGPM	59
2,000-2,999 IGPM	0
3,000-3,999 IGPM	0
4,000-4,999 IGPM	0
>=5,000 IGPM	0



The Basic Fire Flows assigned for Station 31 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for response zone 31 is based on the 95th percentile which is 1,200 imperial gallons per minute.

Table 2 Basic Fire Flows for HRM Response Zone 31

Total RFF Points	183	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,200	90.96
Max	1,200	90.96
5th highest	1,200	90.96

Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 31 is one Engine apparatus. The current apparatus located at Station 31 is a Tanker; there is no Engine at Station 31. There are no volunteers currently stationed at Station 31 which does not meet the minimum of 15 volunteers or four to six full-time staff required on a fire department roster to provide adequate response and be recognized for fire insurance grading purposes.

Fire Calls

The emergency call data for Station 31 is combined with that of Station 30. In the period from January 2010 until September 2013, Station 30 and 31 received 218 emergency calls with the following breakdown as shown in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls could not be identified.

The majority of calls received were Medical emergencies at 65.6% of the total call volume.



Table 3 Emergency calls by Incident Type (Stations 30 & 31)

Call by type			
Type	Total	Year Average	Percentage (%)
Fire	29	8	13.30
False alarm	7	2	3.21
Smoke	6	2	2.75
Motor Vehicle Accidents	16	4	7.34
Oil or Gas spill	1	0	.46
Other	2	1	.92
Rescue	0	0	0.00
Medical Assist	143	38	65.60
Coding	14	4	6.62

Figure 2 Emergency Calls by Incident Type – Station 30 & 31 (2010-2013)

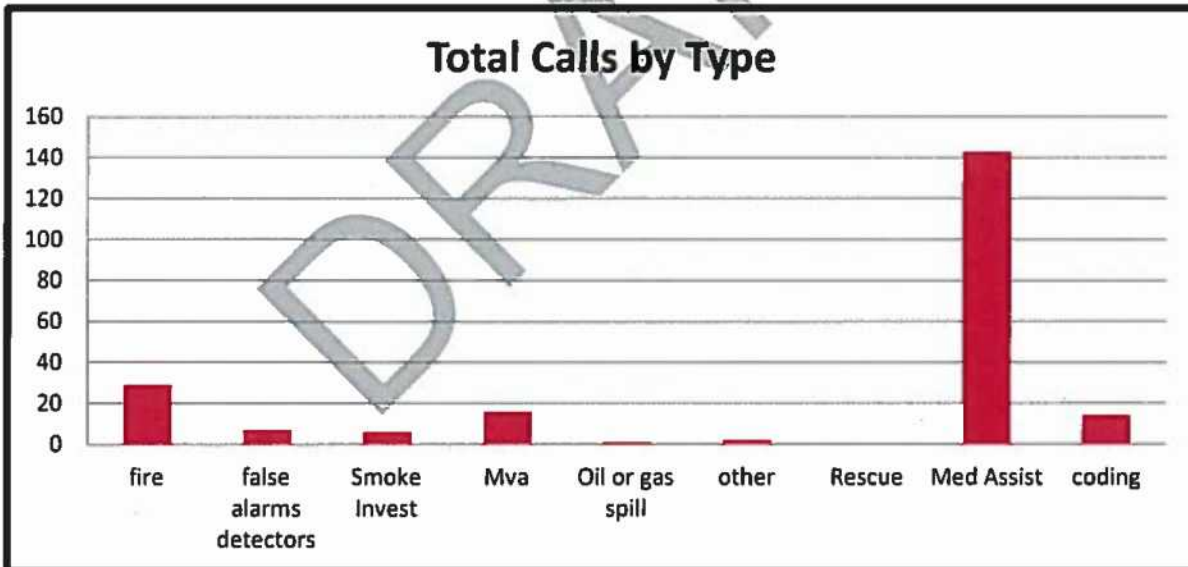


Figure 3 Percentage of Calls by Incident Type – Station 30 & 31 (2010-2013)

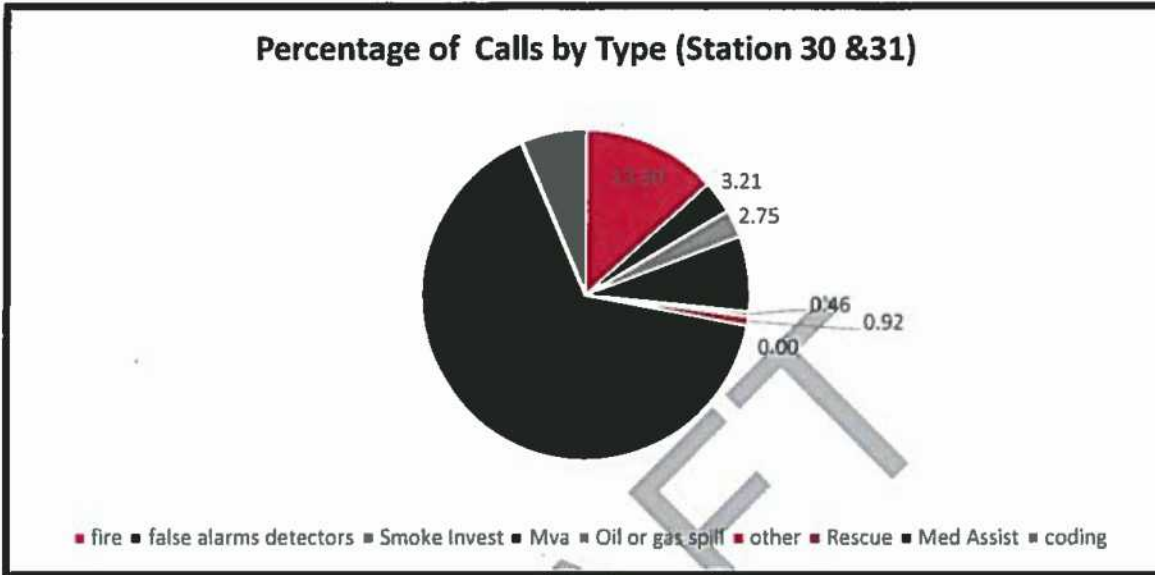
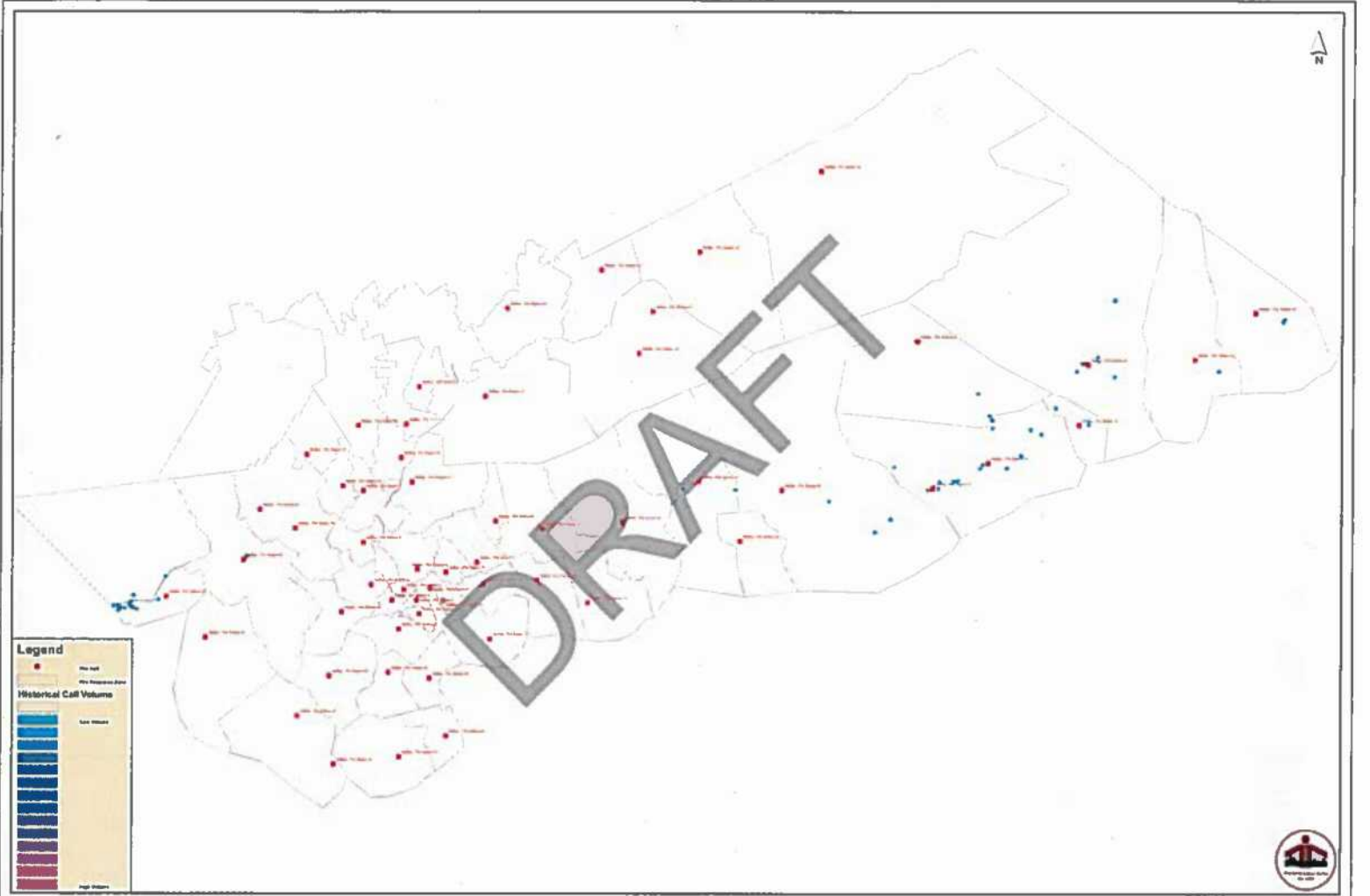


Table 4 is a breakdown of emergency calls by time of day for Station 30 and 31. The bulk of the calls are daytime and evening responses in this area.

Table 4 Emergency calls based on time of day (Station 30 & 31)

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	30	13.8%
Daytime	0700 – 1659	117	53.7%
Evening	1700 – 2359	71	32.5%





Legend

- Fire Station
- Fire Response Area

Historical Call Volume

Light Yellow	Low Volume
Yellow	
Orange	
Red	
Dark Red	
Purple	High Volume

Figure 4 Historical Call Map - Fire Station 31

Scale = 1:145,000

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 31 was assigned a Public Fire Protection Classification of 10 and Dwelling Protection Grade 5.

Recommendations

- Close Station 31. The number of volunteer firefighters at Station 31 is well below the minimum staffing requirements of 15 volunteer fire fighters for response to the risks in this area and for fire insurance grading purposes. In addition the apparatus at this station does not meet the requirements as determined by the Basic Fire Flow in the response zone. Due to staffing and apparatus deficiencies, the station response is not recognized for fire insurance grading. Operating this station therefore presents an undue cost with no corresponding insurance savings. The station is redundant and should be closed.



STATION 33

26291 Highway 7, West Quoddy



Station 33 is located in the community of West Quoddy in the HRM, off of Highway 7. Figure 1 shows the current 2.5km, 5km and 8km response coverage area for Station 33. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows. The green area (5km coverage) represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area (8km coverage) represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by 5 volunteer fire fighters and houses one Tanker and a Rescue vehicle.



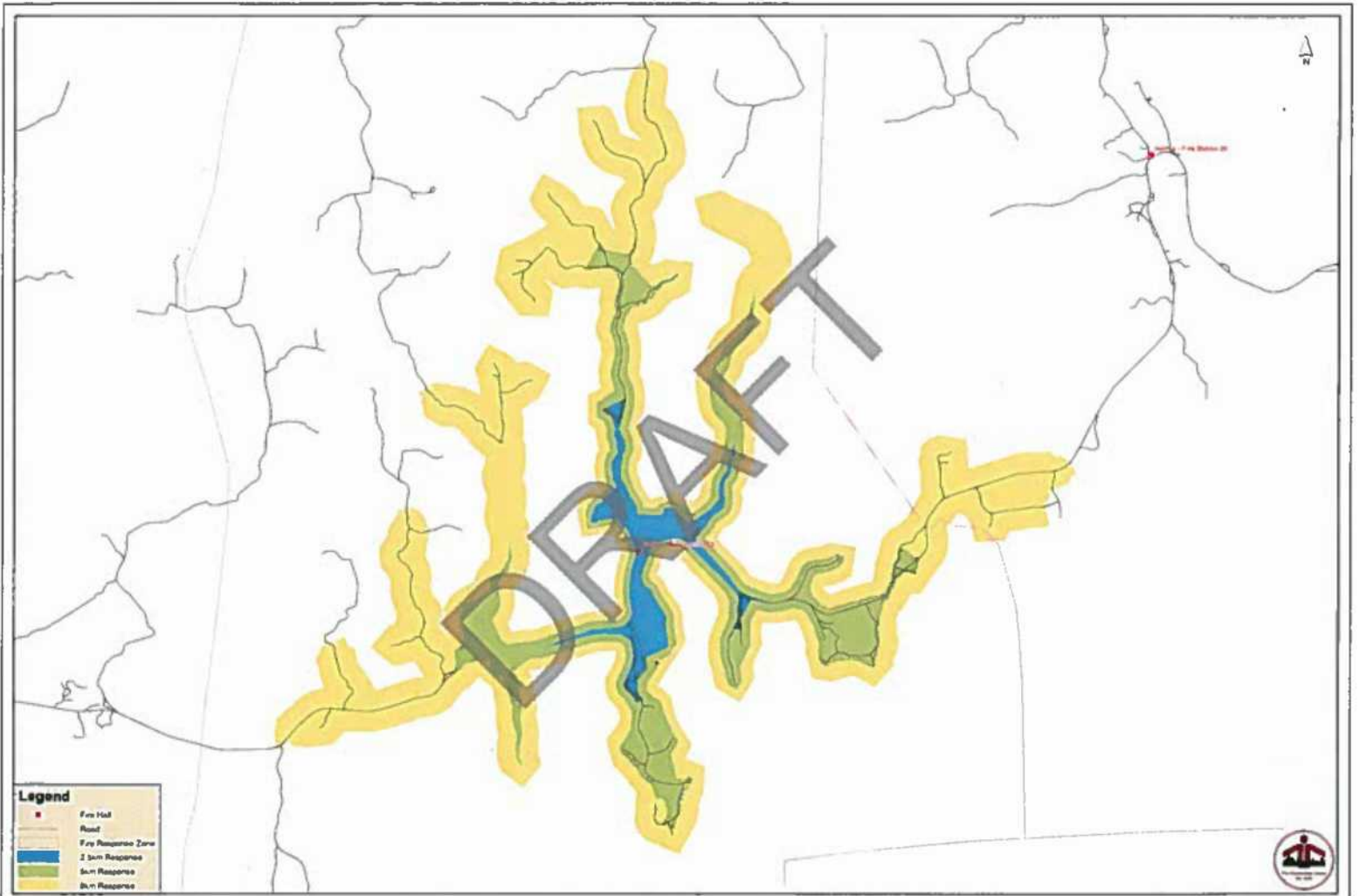
Building and Tarmac

Station 33 is a wood framed building with two apparatus bays. The apparatus bays are not adequately sized to accommodate the apparatus assigned to this station.

The tarmac outside the station is a gravel covered area which extends from the bay door outward. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

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Legend

- Fire Hall
- Road
- 1 km Response Zone
- 2 km Response
- 3 km Response

Figure 1 - 2.5x/3km Response from Fire Station 33

Scale = 1:17,000

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities in Station 33 are not adequate to meet the needs of the fire fighters.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

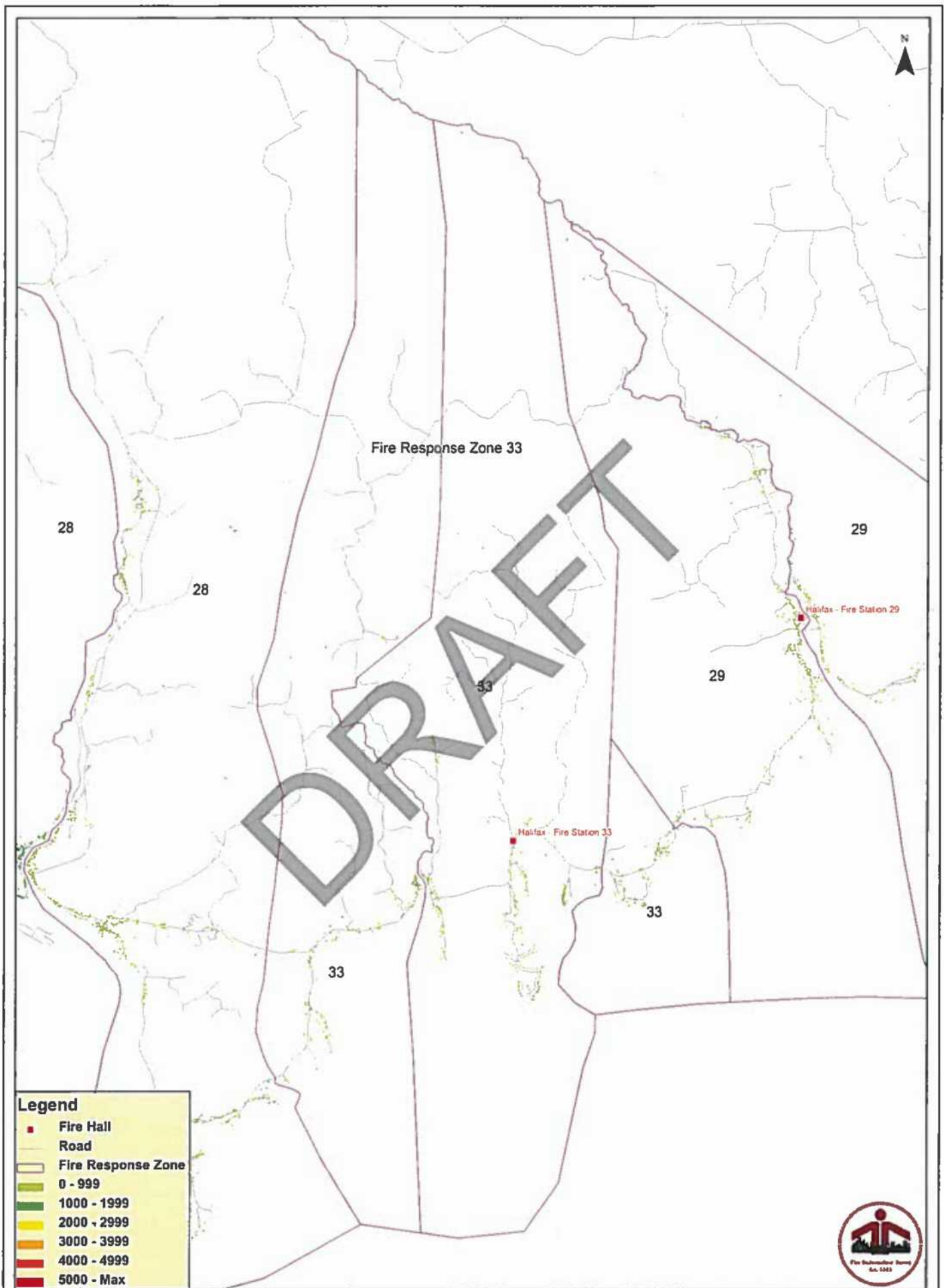
Community Risk Profile – Response Zone 33

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 376 Required Fire Flows were calculated for Response Zone 33 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 33

RFF Range	No. of RFF points
0-999 IGPM	302
1000-1999 IGPM	74
2000-2999 IGPM	0
3000-3999 IGPM	0
4000-4999 IGPM	0
≥ 5000 IGPM	0





The Basic Fire Flows assigned for Station 33 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited to large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response zone 33 is based on the 95th percentile which is 1,200 imperial gallons per minute.

Table 2 Basic Fire Flows for HRM Response Zone 33

Total RFF Points	376	
	IGPM	l/s
90th Percentile	1,200	90.96
95th Percentile	1,200	90.96
Max	1,700	128.86
5th highest	1,400	106.12

Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 33 is one Engine apparatus. Station 33 is equipped with one Engine. Standard staffing for Station 33 is 5 volunteers, which is well below the minimum of 15 volunteers or four to six full-time staff required on a fire department roster to provide adequate response and be recognized for fire insurance grading purposes.

Fire Calls

In the period from January 2010 until September 2013 Station 33 received a total of 34 emergency calls with a breakdown by call type as described in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls could not be identified.

The majority of calls responded to by Station 33 were fire calls at 38% of the total call volume.



Table 3 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	13	3	38.24
False alarm	2	0.5	5.88
Smoke	2	0.5	5.88
Motor Vehicle Accident	1	0	2.94
Oil or Gas spill	0	0	0.00
Other	1	0	2.94
Rescue	0	0	0.00
Medical Assist	11	3	32.36
Coding	4	1	11.76

Figure 3 Emergency Calls by Incident Type (2010-2013)

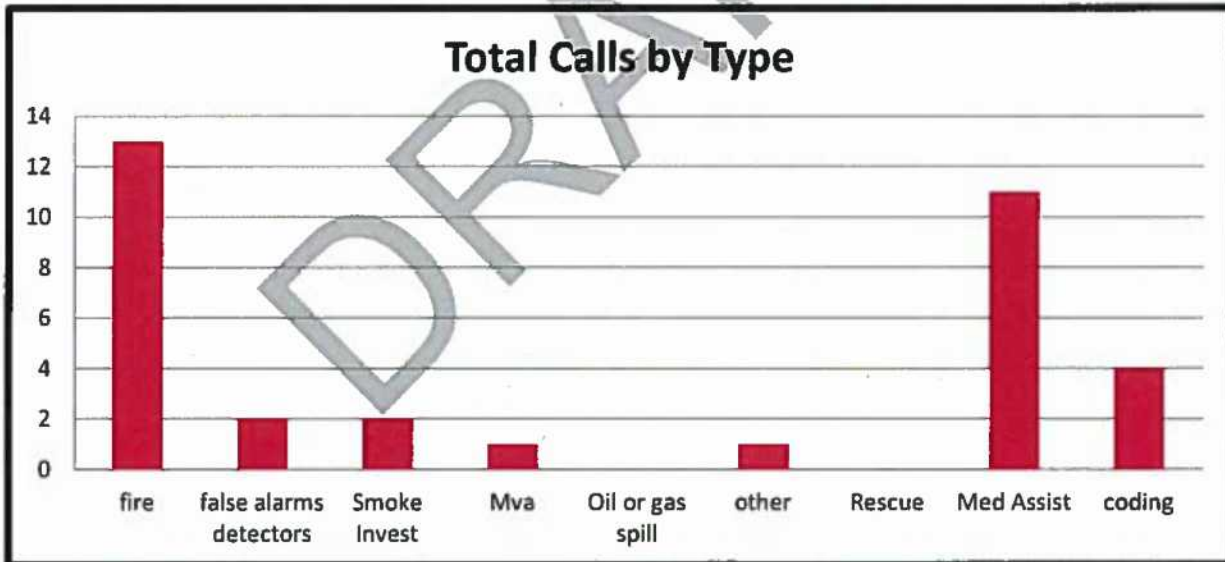


Figure 4 Percentage of Calls by Incident Type (2010-2013)

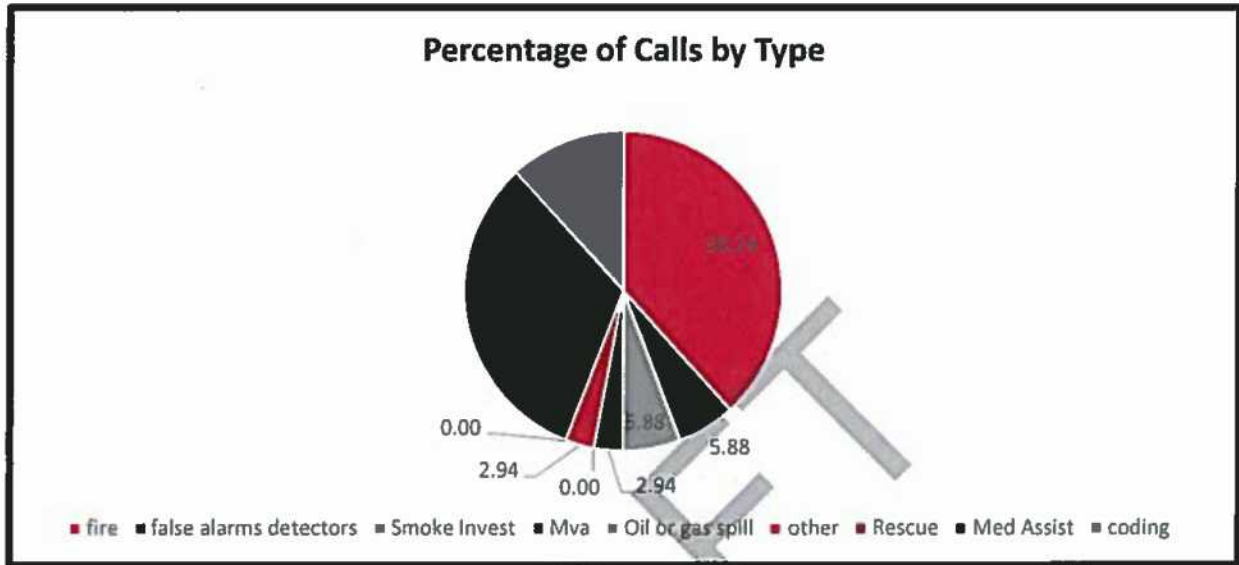


Table 4 is a breakdown of the fire calls by time of day for Station 33. The bulk of the calls are daytime and evening responses in this area.

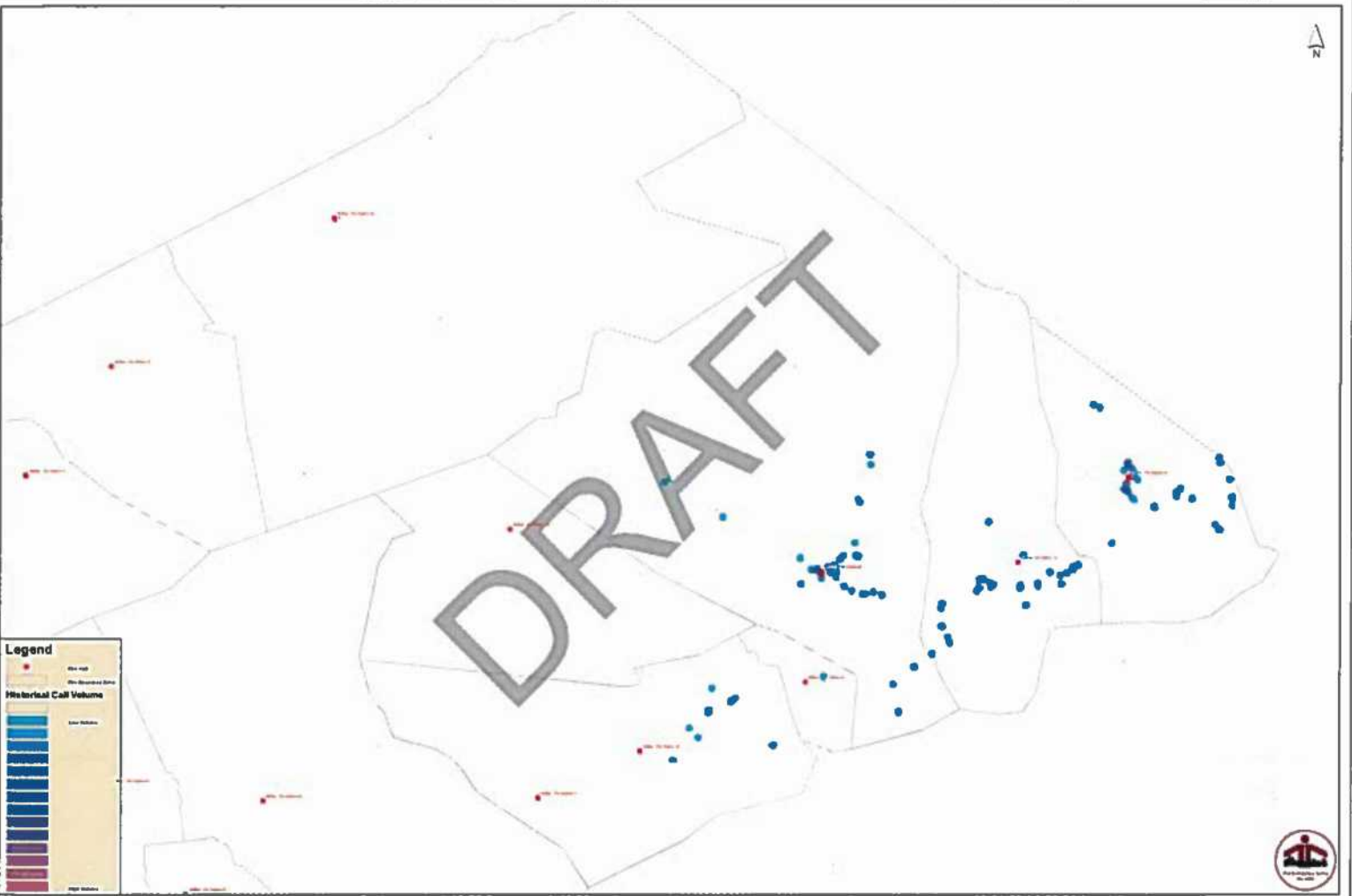
Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	00:00 – 06:59	3	9.1%
Daytime	07:00 – 16:59	21	60.6%
Evening	17:00 – 23:59	10	30.3%





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Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 33 was assigned a Public Fire Protection Classification of 10 and Dwelling Protection Grade 5.

Recommendations

- Close Station 33. The number of volunteer firefighters at Station 33 is well below the minimum staffing requirements of 15 volunteer fire fighters for response to the risks in this area and for fire insurance grading purposes. In addition the apparatus at this station does not meet the requirements as determined by the Basic Fire Flow in the response zone. Recruiting enough volunteers to improve the roster levels is unlikely and the number of fire calls does not warrant assigning an E-platoon to this station. Due to staffing and apparatus deficiencies, the station response is not recognized for fire insurance grading. Operating this station therefore presents an undue cost with no corresponding insurance savings. The station is redundant and should be closed.



STATION 34
22 Powers Road, Mushaboom



Station 34 is located in the community of Mushaboom in the HRM, off of Powers Road. Figure 1 shows the current 2.5km, 5km and 8km response coverage area for Station 34. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows. The green area (5km coverage) represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area (8km coverage) represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by 7 volunteer fire fighters and houses one Engine and a tactical support unit.



Building and Tarmac

The station construction is wood frame with two apparatus bays. The station can adequately house the apparatus assigned to it.

The tarmac outside the station is a gravel covered area which extends from the bay door outward. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

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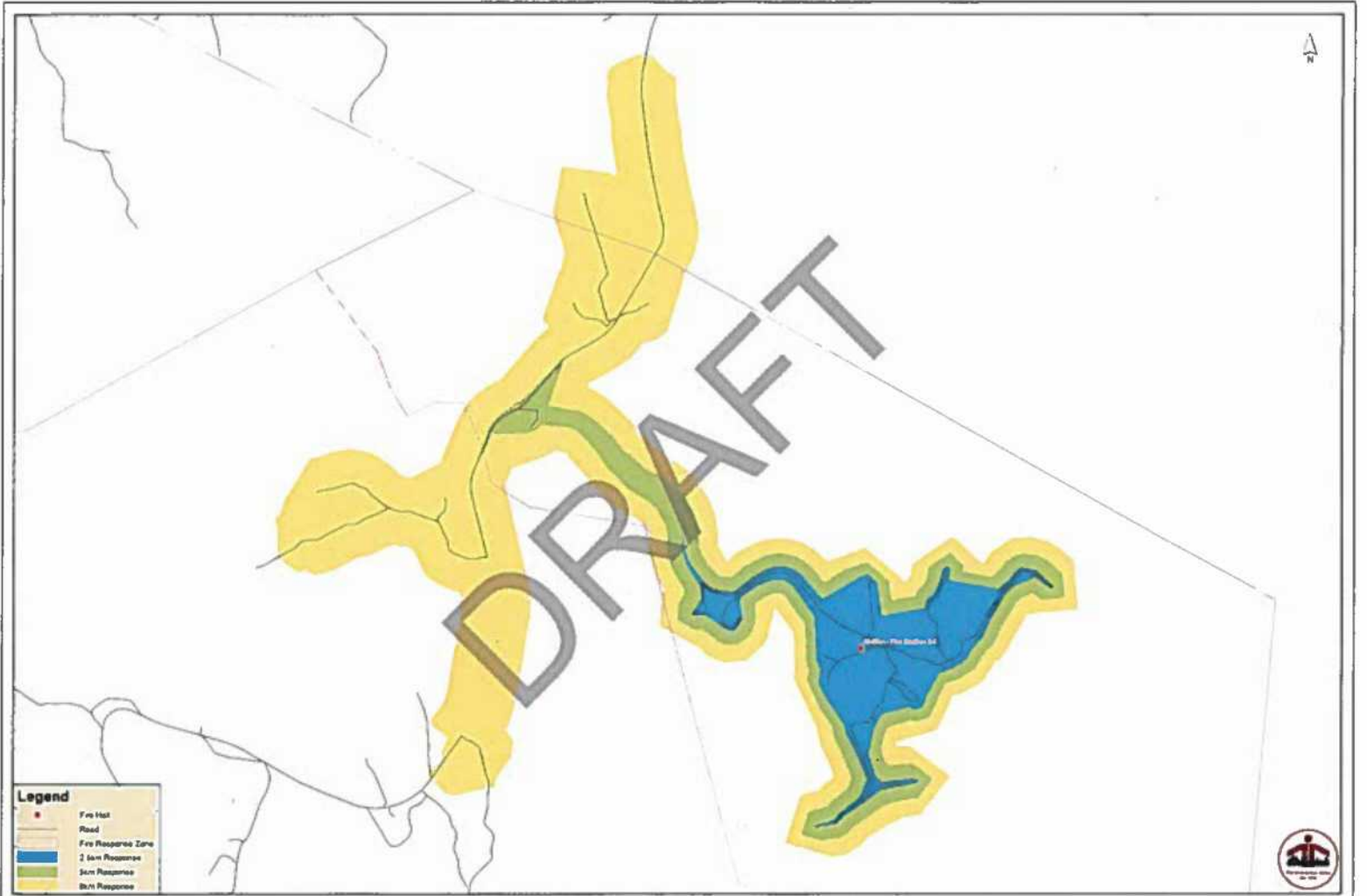


Figure 1 - 2.5/5km Response from Fire Station 34

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities in Station 34 are adequate to meet the needs of the fire fighters.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

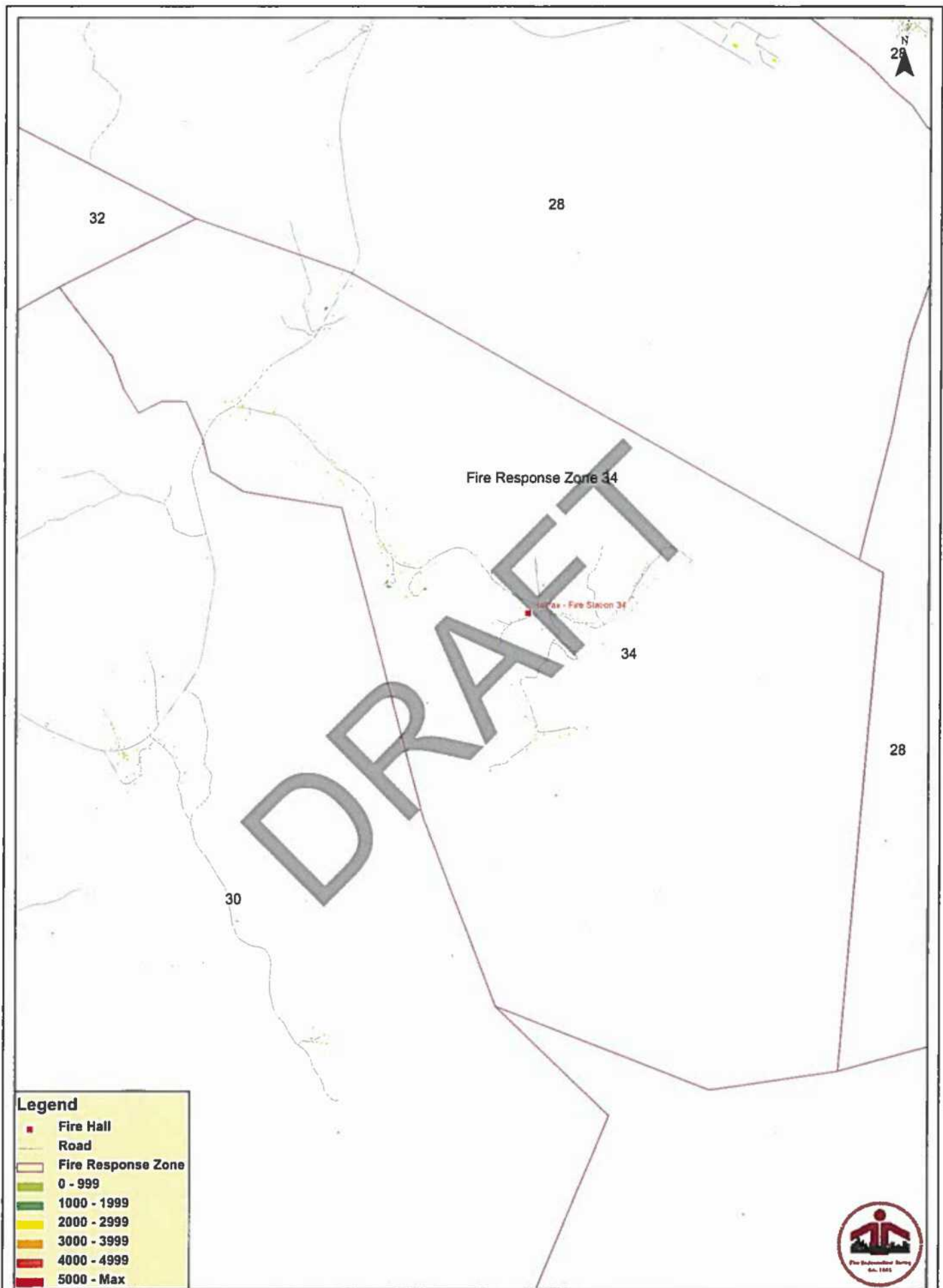
Community Risk Profile – Response Zone

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 136 Required Fire Flows were calculated for Response Zone 34 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 34

RFI Range	No. of RFI points
0-999 IGPM	109
1000-1999 IGPM	27
2000-2999 IGPM	0
3000-3999 IGPM	0
4000-4999 IGPM	0
>=5000 IGPM	0





32

28

Fire Response Zone 34

Halifax - Fire Station 34

34

28

30

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Fire Department Survey 64, 1985

The Basic Fire Flows assigned for Station 34 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited to large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response zone 34 is based on the 95th percentile which is 1,200 imperial gallons per minute.

Table 2 Basic Fire Flows for HRM Response Zone 34

Total RFF Points	136	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,200	90.96
Max	1,900	144.02
5th highest	1,200	90.96

Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 34 is one Engine apparatus. Station 34 is equipped with one Engine. Standard staffing for Station 34 is 7 volunteers, which is well below the minimum of 15 volunteers or four to six full-time staff volunteers required on a fire department roster to provide adequate response and be recognized for fire insurance grading purposes.

Fire Calls

In the period from January 2010 until September 2013, Station 34 received a total of 29 emergency calls with a breakdown by call type as described in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls that could not be identified.

The majority of calls responded to from this station were Medical emergencies at 48% of the total call volume.



Table 3 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	5	1	17.24
False alarm	4	1	13.79
Smoke	1	0	3.45
Motor Vehicle Accident	2	0.5	6.90
Oil or Gas spill	0	0	0.00
Other	1	0	3.45
Rescue	0	0	0.00
Medical Assist	14	4	48.27
Coding	2	1	6.90

Figure 3 Emergency Calls by Incident Type (2010-2013)

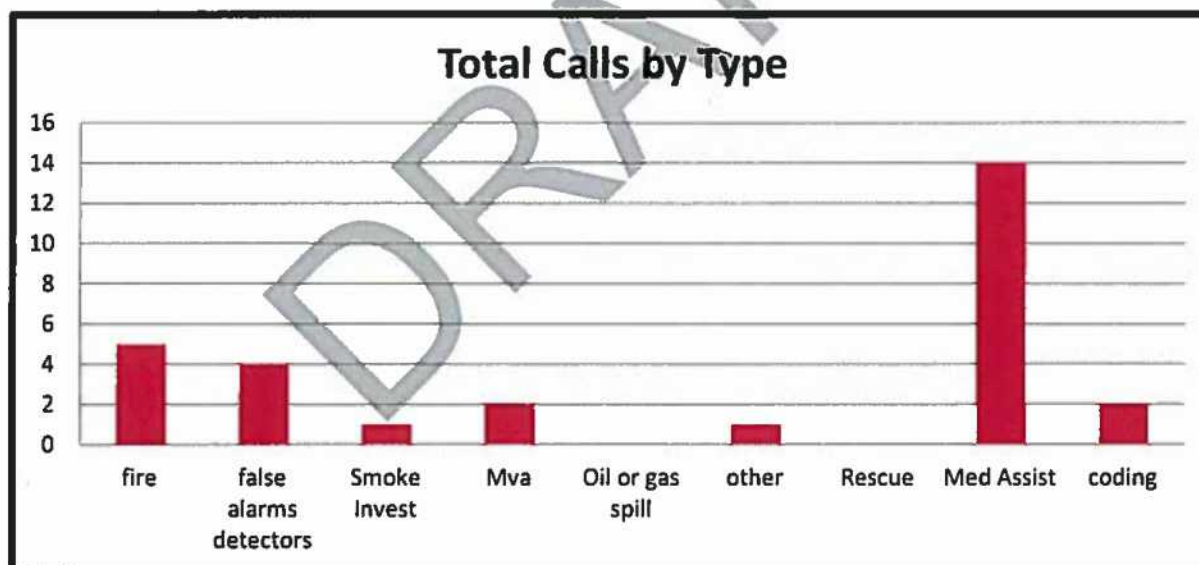


Figure 4 Percentage of Calls by Incident Type (2010-2013)

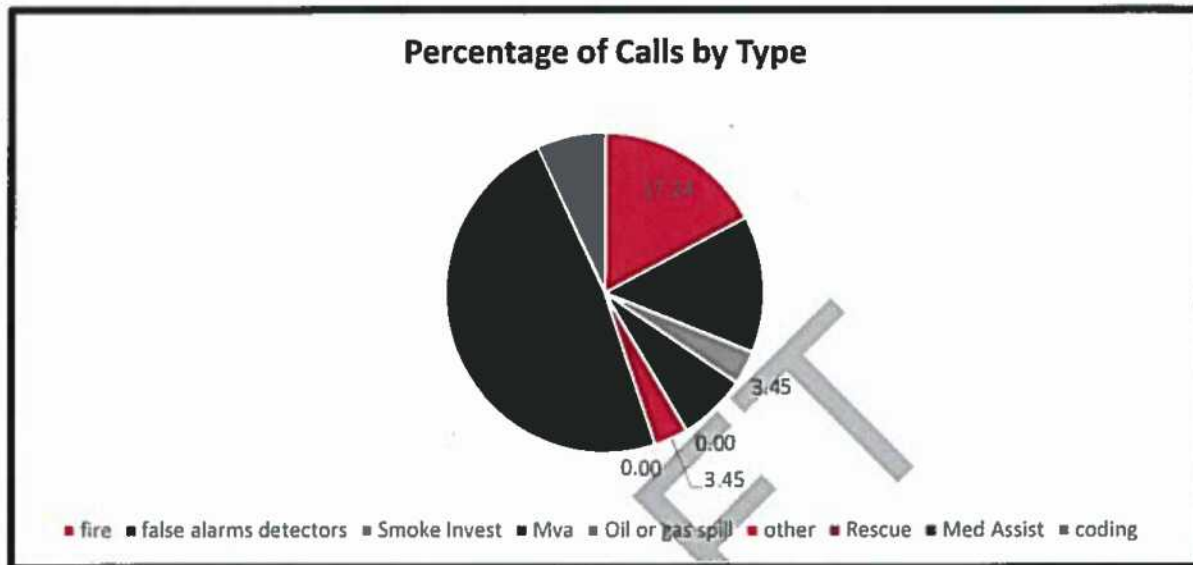


Table 4 is a breakdown of the fire calls by time of day for Station 34. The total number of calls in Table 4 does not include calls whereby the apparatus returned to the station or those for which the type of call could not be identified. The bulk of the calls are daytime and evening responses in this area.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	00:00 – 06:59	9	33.3%
Daytime	07:00 – 16:59	11	40.7%
Evening	17:00 – 23:59	7	26.0%





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Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 34 was assigned a Public Fire Protection Classification of 10 and Dwelling Protection Grade 5.

Recommendations

- Close Station 34. The number of volunteer firefighters at Station 34 is well below the minimum staffing requirements of 15 volunteer fire fighters for response to the risks in this area and for fire insurance grading purposes. Due to staffing deficiencies, the station response is not recognized for fire insurance grading. Operating this station therefore presents an undue cost with no corresponding insurance savings. The station is redundant and should be closed.



STATION 35

39 Corbett Road, Cooks Brook



Station 35 is located in the community of Cooks Brook in the HRM, off of Corbett Road. Figure 1 shows the current 2.5km, 5km and 8km response coverage area for Station 35. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area (5km coverage) represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area (8km coverage) represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by 11 volunteer fire fighters and houses one Engine and a Rescue vehicle.



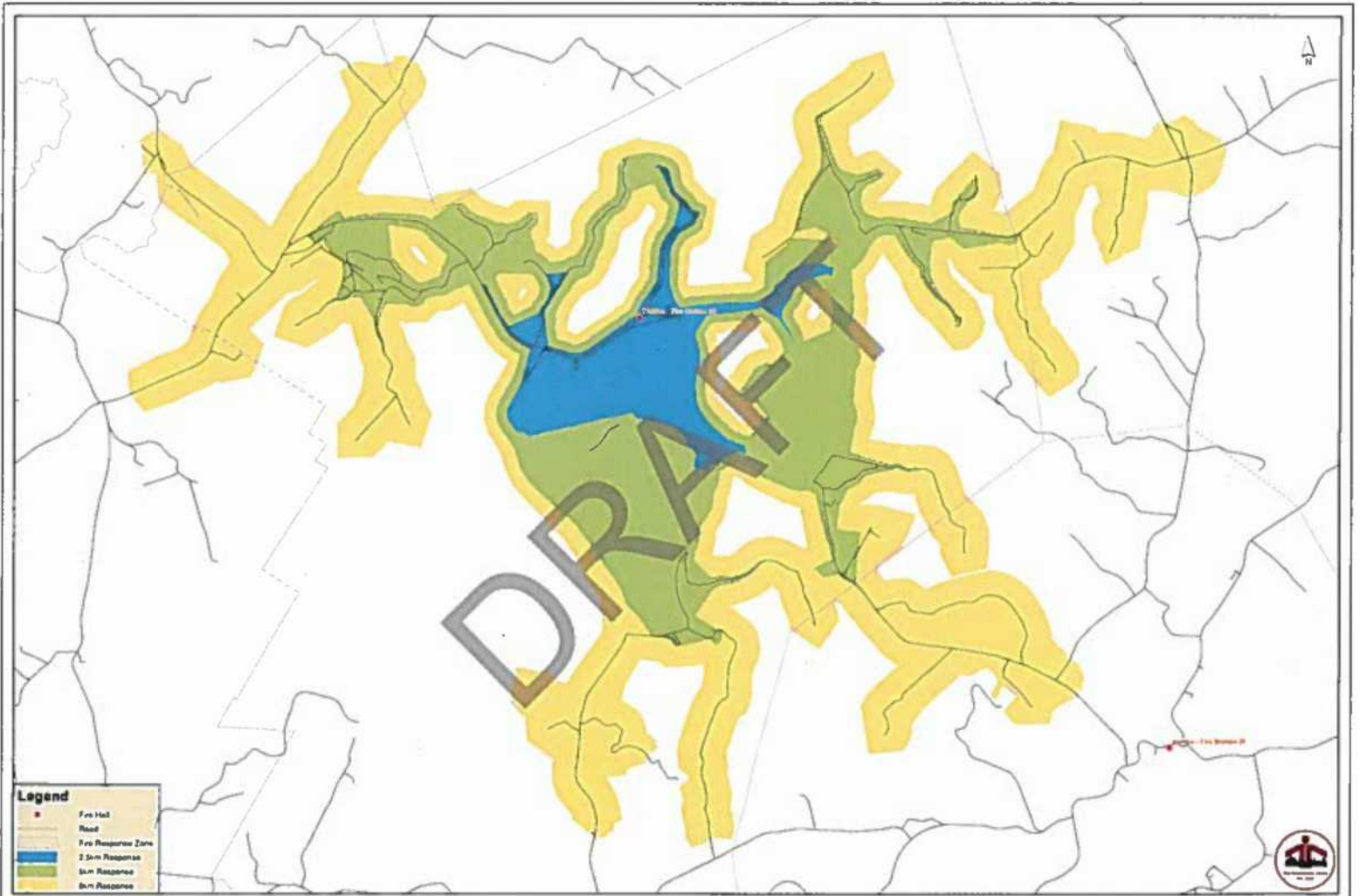
Building and Tarmac

The station construction is composed of metal cladding, on a wood frame. The building has two apparatus bays which adequately house the apparatus assigned to the station.

The tarmac outside the station is gravel and asphalt covered area which extends from the bay door outward. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

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Legend

- Fire Hall
- Road
- Fire Response Zone
- 2.5km Response
- 5km Response

Figure 1 - 2.5/5km Response from Fire Station 35

Regional Municipality of Halifax

Scale = 1:14,000



Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities in Station 35 are adequate to meet the needs of the fire fighters.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

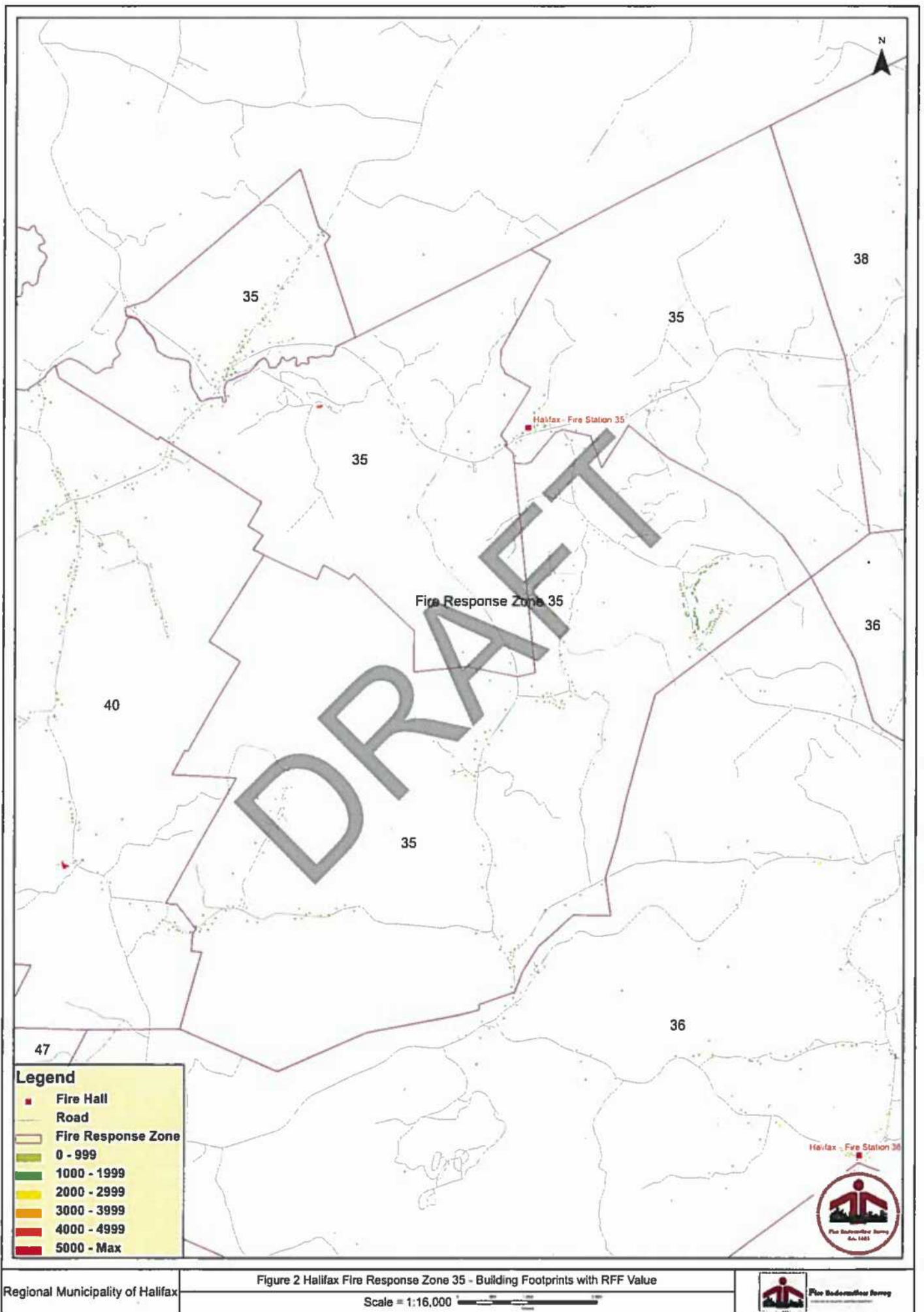
Community Risk Profile – Response Zone 35

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 381 Required Fire Flows were calculated for Response Zone 35 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 35

RFF Range	No. of RFF points
0-999 IGPM	15
1000-1999 IGPM	363
2000-2999 IGPM	2
3000-3999 IGPM	0
4000-4999 IGPM	1
>=5000 IGPM	0





The Basic Fire Flows assigned for Station 35 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response zone 35 is based on the 95th percentile which is 1,000 imperial gallons per minute.

Table 2 Basic Fire Flows for HRM Response Zone 35

Total RFF Points	381	
	IGPM	L/s
90th Percentile	1,000	75.80
95th Percentile	1,000	75.80
Max	4,300	325.94
5th highest	1,900	144.02

Apparatus and Personnel

Based on the Basic Fire Flow of 1,000 IGPM, the benchmark number of apparatus required for Fire Station 35 is one Engine apparatus. Station 35 is equipped with one Engine. Standard staffing for Station 35 is 11 volunteers, which is below the minimum of 15 volunteers or four to six full-time staff required on a fire department roster to provide adequate response and be recognized for fire insurance grading purposes.

Fire Calls

In the period from January 2010 until September 2013 Station 35 received 106 emergency calls with a breakdown by call type as described in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls could not be identified.

The majority of calls responded to were Medical emergencies at 55.6% of the total call volume.



Table 3 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year Average	Percentage (%)
Fire	27	7	25.47
False alarm	1	0	0.94
Smoke	2	0.5	1.89
Motor Vehicle Accident	10	3	9.43
Oil or Gas spill	0	0	0.00
Other	0	0	0.00
Rescue	0	0	0.00
Medical Assist	59	16	55.66
Coding	7	2	6.61

Figure 3 Emergency Calls by Incident Type (2010-2013)

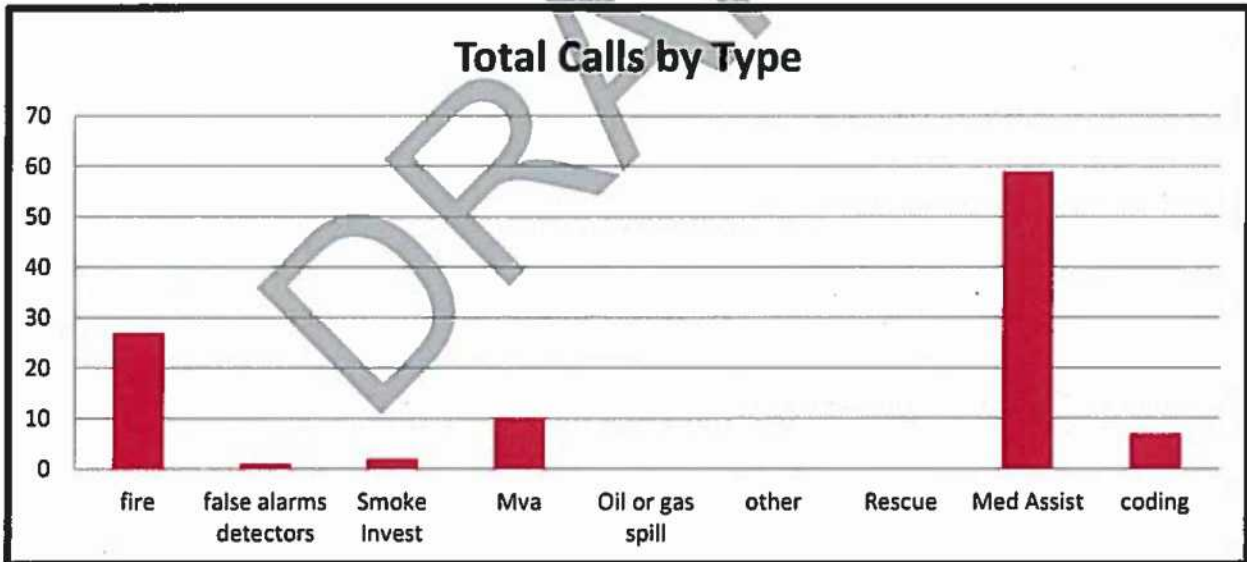


Figure 4 Percentage of Calls by Incident Type (2010-2013)

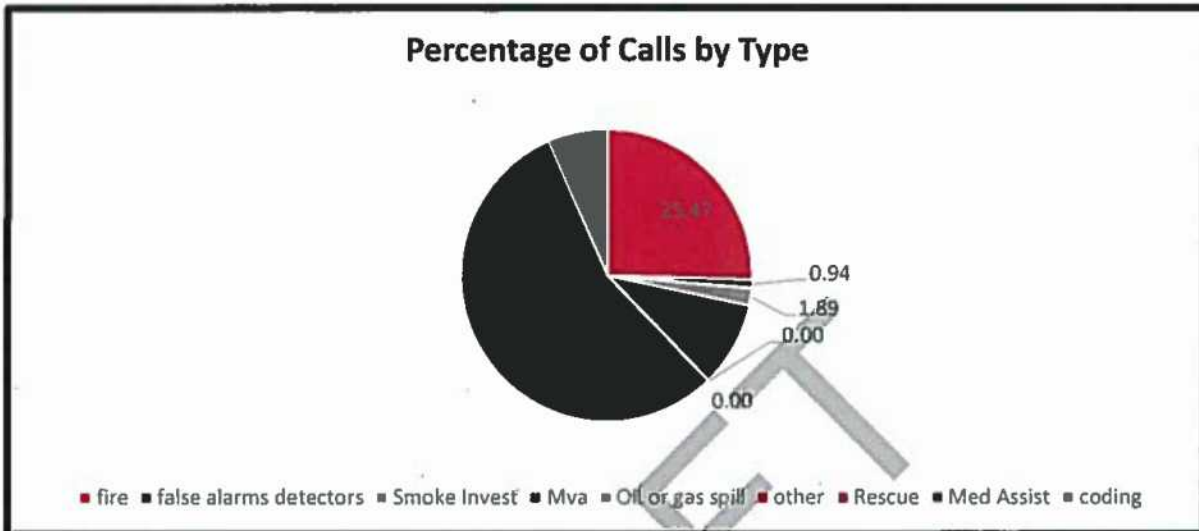


Table 4 is a breakdown of the fire calls by time of day for Station 35. The total number of calls in Table 4 does not include calls whereby the apparatus returned to the station or those for which the type of call could not be identified. The bulk of the calls are daytime and evening responses in this area.

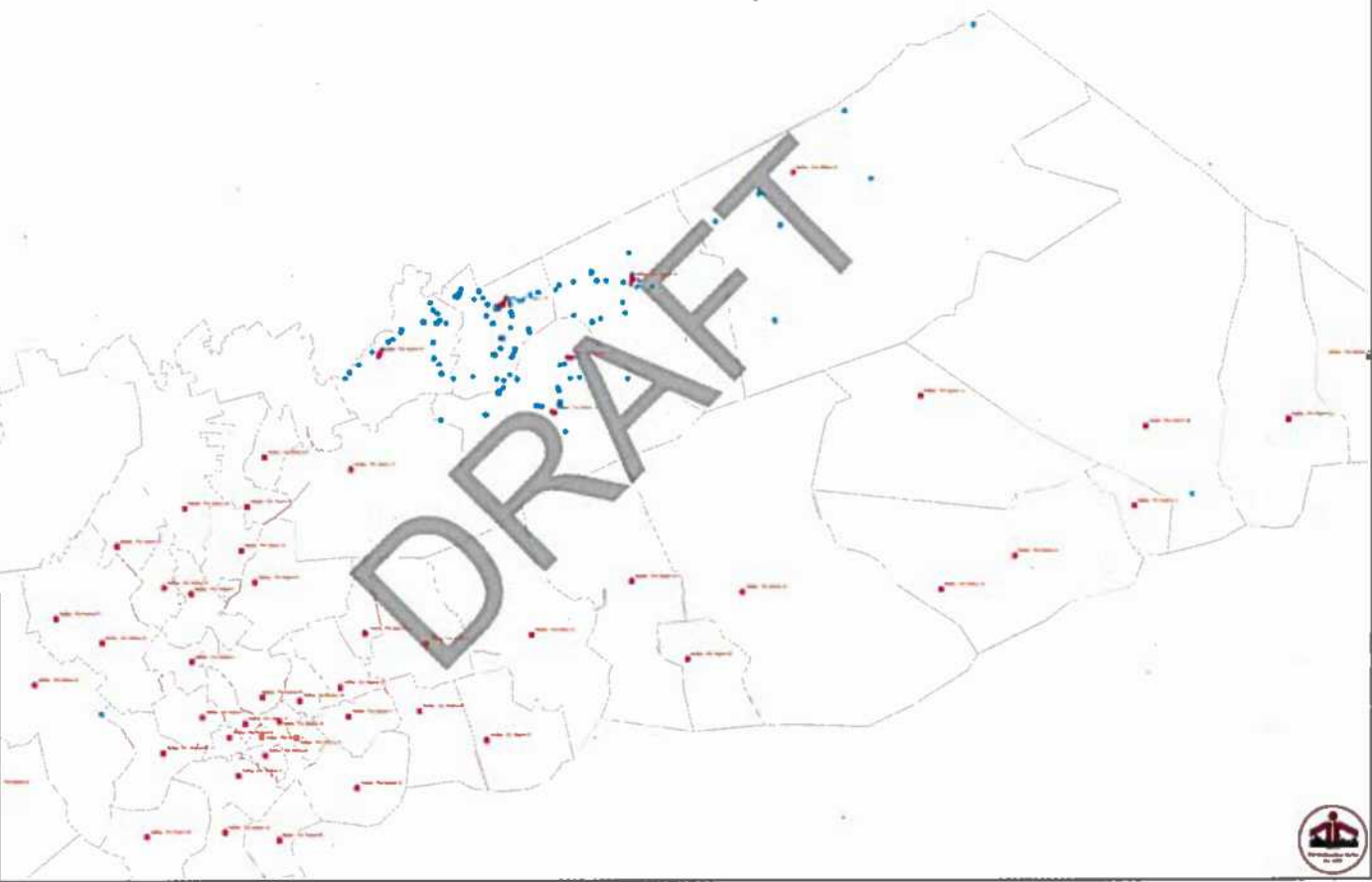
Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	00:00 – 06:59	18	18.0%
Daytime	07:00 – 16:59	44	44.0%
Evening	17:00 – 23:59	38	38.0%





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Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 35 was assigned a Public Fire Protection Classification of 10 and Dwelling Protection Grade 5.

Recommendations

- Close Station 35. The number of volunteer firefighters at Station 35 is below the minimum staffing requirements of 15 volunteer fire fighters for response to the risks in this area and for fire insurance grading purposes. Recruiting enough volunteers to improve the roster levels is unlikely and the number of fire calls does not warrant assigning an E-platoon to this station. Due to staffing deficiencies, the station response is not recognized for fire insurance grading. Operating this station therefore presents an undue cost with no corresponding insurance savings. The station is redundant and should be closed.



STATION 36

4413 Highway 357, Meaghers Grant



Station 36 is located in the community of Meaghers Grant in the HRM, off of Highway 357. Figure 1 shows the current 2.5km, 5km and 8km response coverage area for Station 36. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area (5km coverage) represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area (8km coverage) represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by two volunteer fire fighters and houses one Tanker and a Rescue vehicle.



Building and Tarmac

The station building is constructed of wood paneling with an asphalt shingle roof. Building code violations were noted in the overall layout of the building.

The tarmac outside the station is an asphalt covered area which extends from the bay door to the street. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

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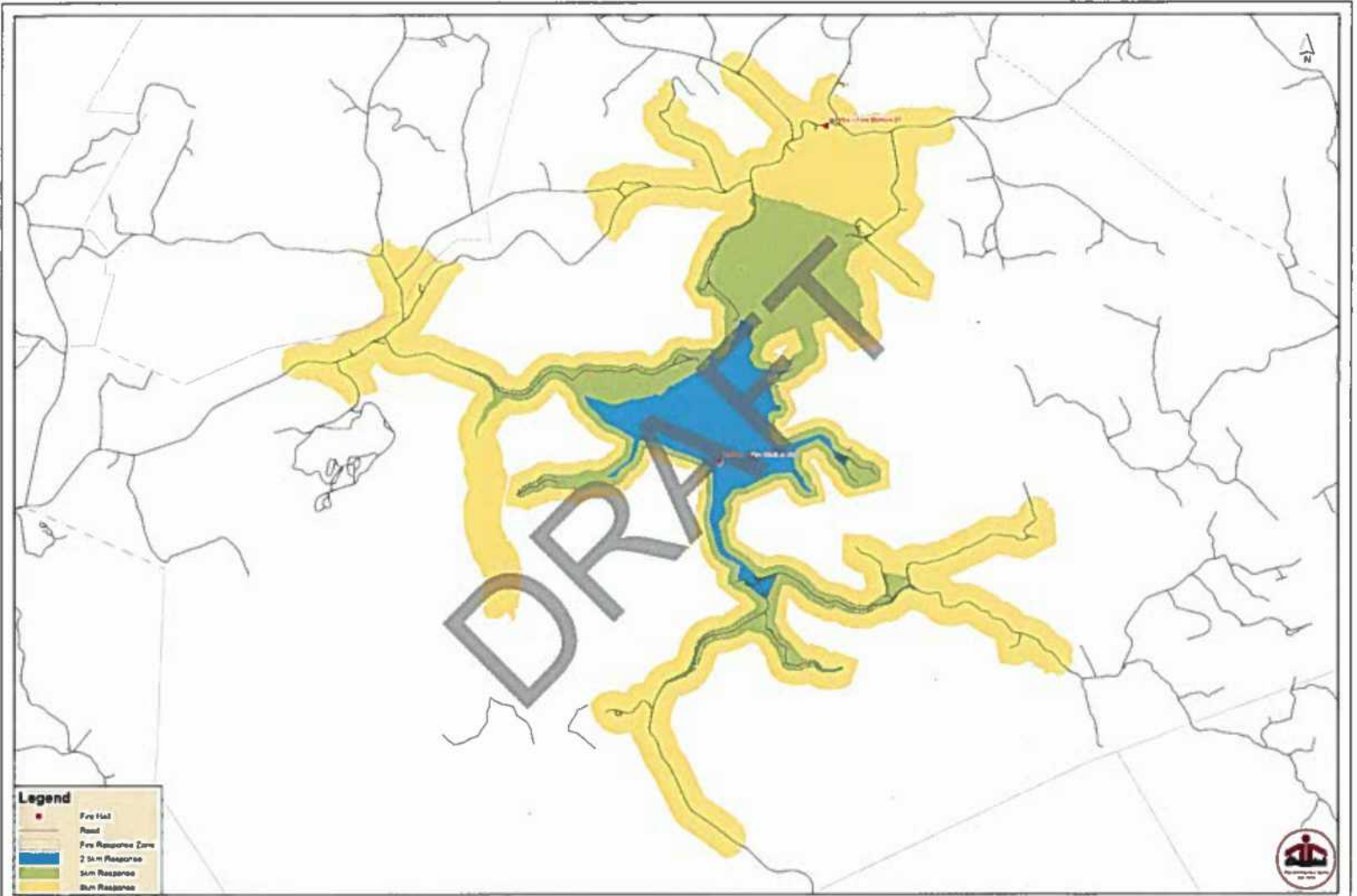


Figure 1 - 2.5/5/10km Response from Fire Station 35

Scale = 1:18,000

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The Station has minimal facilities for crew members. The facilities in Station 36 are not adequate to meet the needs of the fire fighters.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

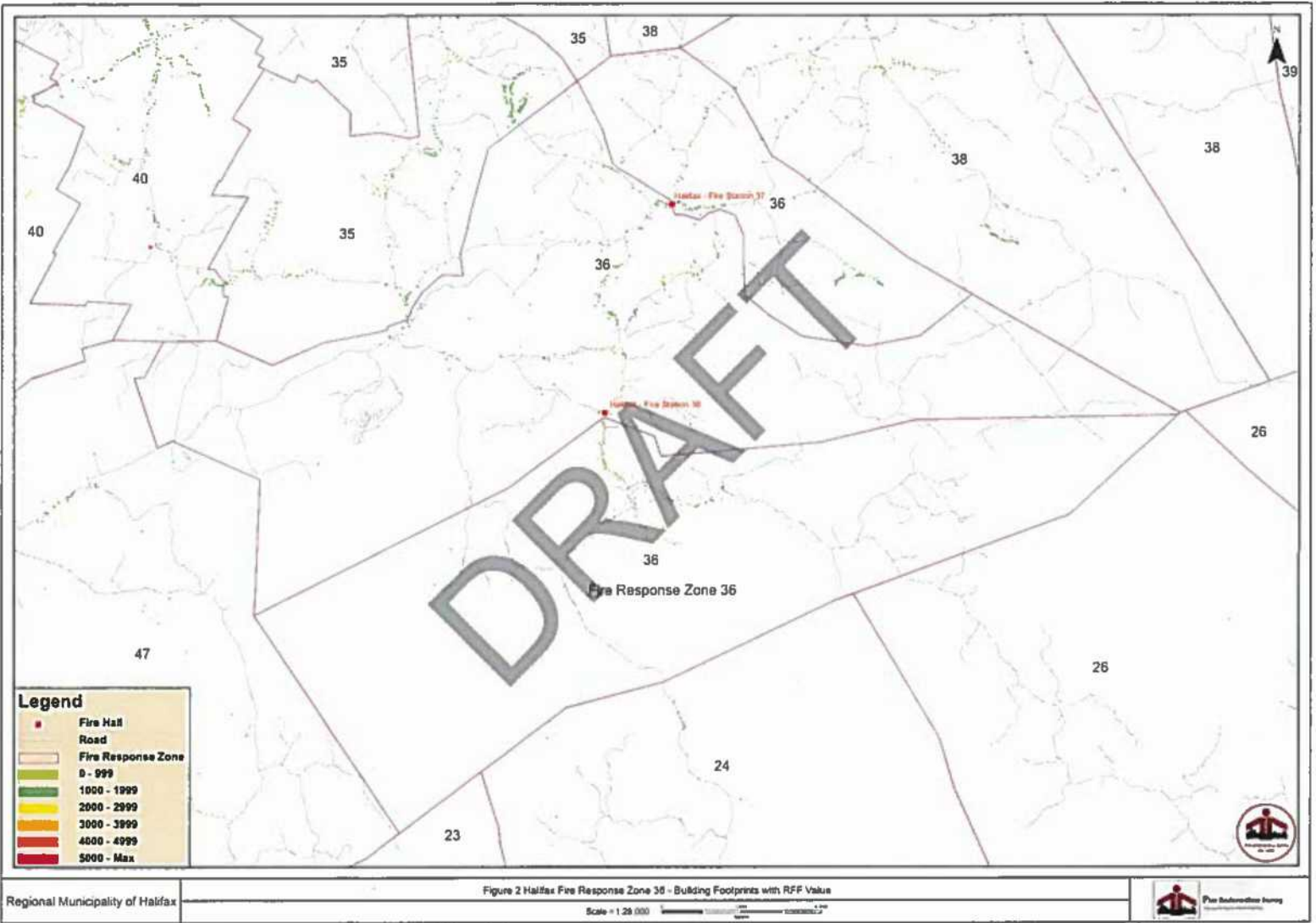
Community Risk Profile – Response Zone 36

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 435 Required Fire Flows were calculated for Response Zone 36 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 36

RFF Range	No. of RFF points
0-999 IGPM	98
1000-1999 IGPM	332
2000-2999 IGPM	5
3000-3999 IGPM	0
4000-4999 IGPM	0
>=5000 IGPM	0





The Basic Fire Flows assigned for Station 36 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited to large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response zone 36 is based on the 95th percentile which is 1,000 imperial gallons per minute.

Table 2 Basic Fire Flows for HRM Response Zone 36

Total RFF Points	435	
	IGPM	l/s
90th Percentile	1,000	75.80
95th Percentile	1,000	75.80
Max	2,900	219.82
5th highest	2,100	159.18

Apparatus and Personnel

Based on the Basic Fire Flow of 1,000 IGPM, the benchmark number of apparatus required for Fire Station 36 is one Engine apparatus. There is no Engine at Station 36. Standard staffing for Station 36 is two volunteers, which is well below the minimum of 15 volunteers or four to six full-time staff required on a fire department roster to provide adequate response and be recognized for fire insurance grading purposes.

Fire Calls

In the period from January 2010 until September 2013 Station 36 received 95 emergency calls with a breakdown by call type as shown in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls could not be identified.

The majority of calls responded to were Medical calls at 40% of the total call volume.



Table 3 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year Average	Percentage (%)
Fire	31	8	32.63
False alarm	0	0	0.00
Smoke	2	0.5	2.11
Motor Vehicle Accidents	13	3	13.68
Oil or Gas spill	0	0	0.00
Other	2	0.5	2.11
Rescue	1	0	1.05
Medical Assist	38	10	40.00
Coding	8	2	8.42

Figure 3 Emergency Calls by Incident Type (2010-2013)

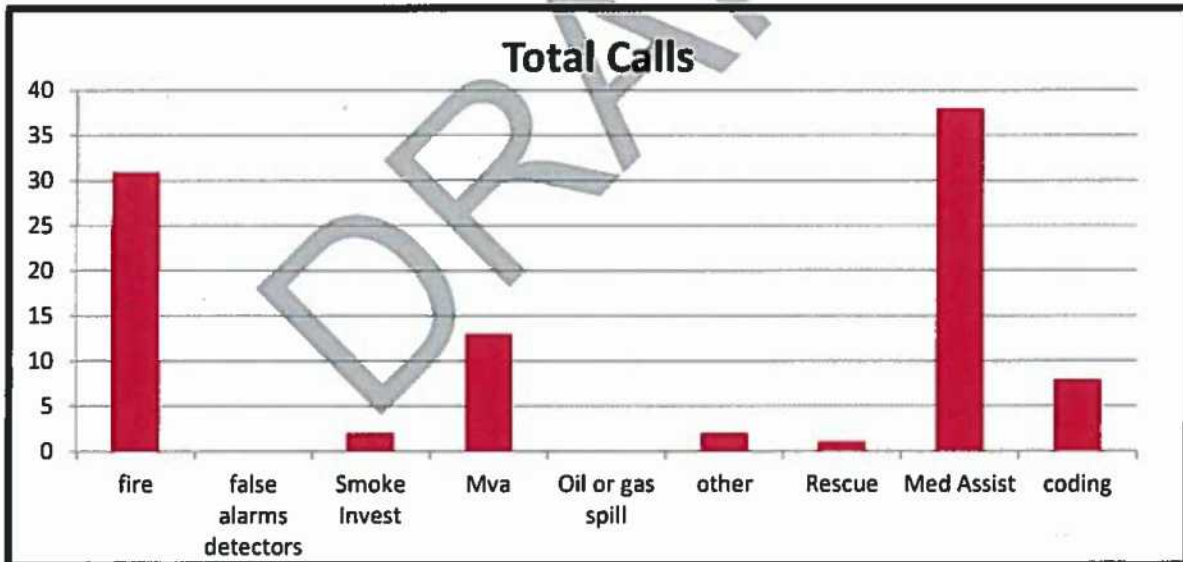


Figure 4 Percentage of Calls by Incident Type (2010-2013)

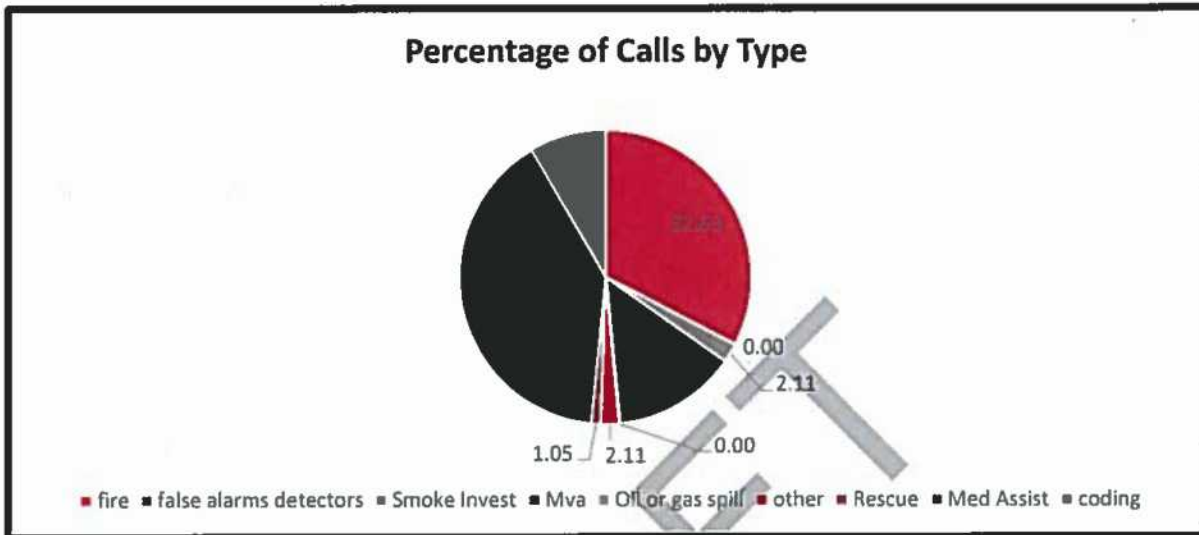
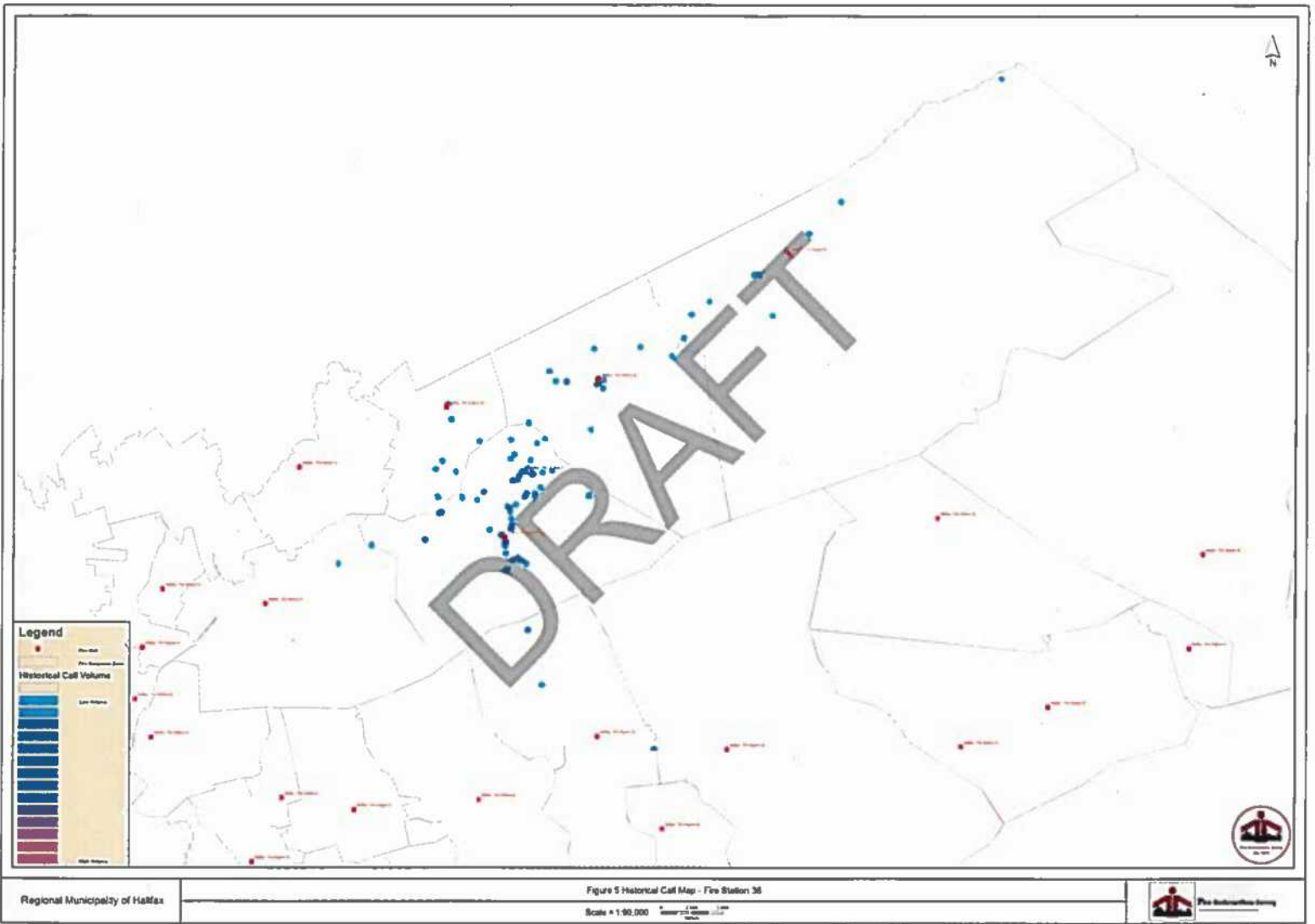


Table 4 is a breakdown of the fire calls by time of day for Station 36. The bulk of the calls are daytime and evening responses in this area.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	00:00 – 06:59	12	12.6%
Daytime	07:00 – 16:59	49	51.6%
Evening	17:00 – 23:59	34	35.8%





Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 36 was assigned a Public Fire Protection Classification of 10 and Dwelling Protection Grade 5.

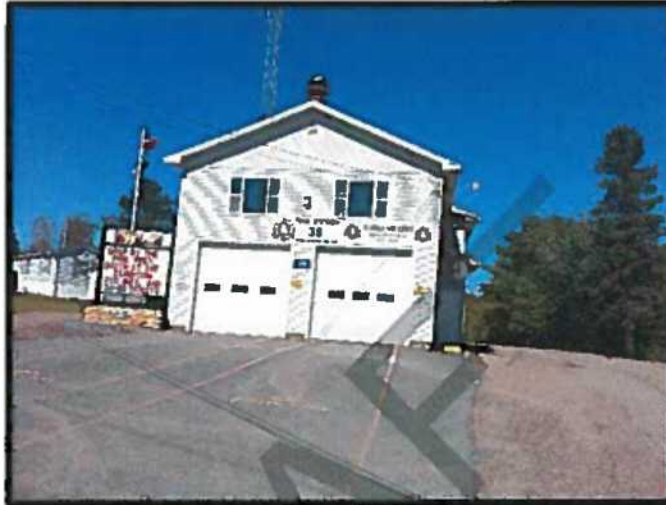
Recommendations

- Close Station 36. The number of volunteer firefighters at Station 36 is well below the minimum staffing requirements of 15 volunteer fire fighters for response to the risks in this area and for fire insurance grading purposes. In addition the apparatus at this station does not meet the requirements as determined by the Basic Fire Flow in the response zone. Due to staffing and apparatus deficiencies, the station response is not recognized for fire insurance grading. Operating this station therefore presents an undue cost with no corresponding insurance savings. The station is redundant and should be closed.



STATION 38

36 Glenmore Road, Middle Musquodoboit



Station 38 is located in the community of Middle Musquodoboit in the HRM, off of Glenmore Road. Figure 1 shows the current 2.5 km, 5 km and 8 km response coverage area for Station 38. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area (5 km coverage) represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area (8 km coverage) represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by 18 volunteer fire fighters with an E-Platoon of four paid staff during the day. Station 38 houses an Engine, Tanker and a Rescue vehicle.

Building and Tarmac

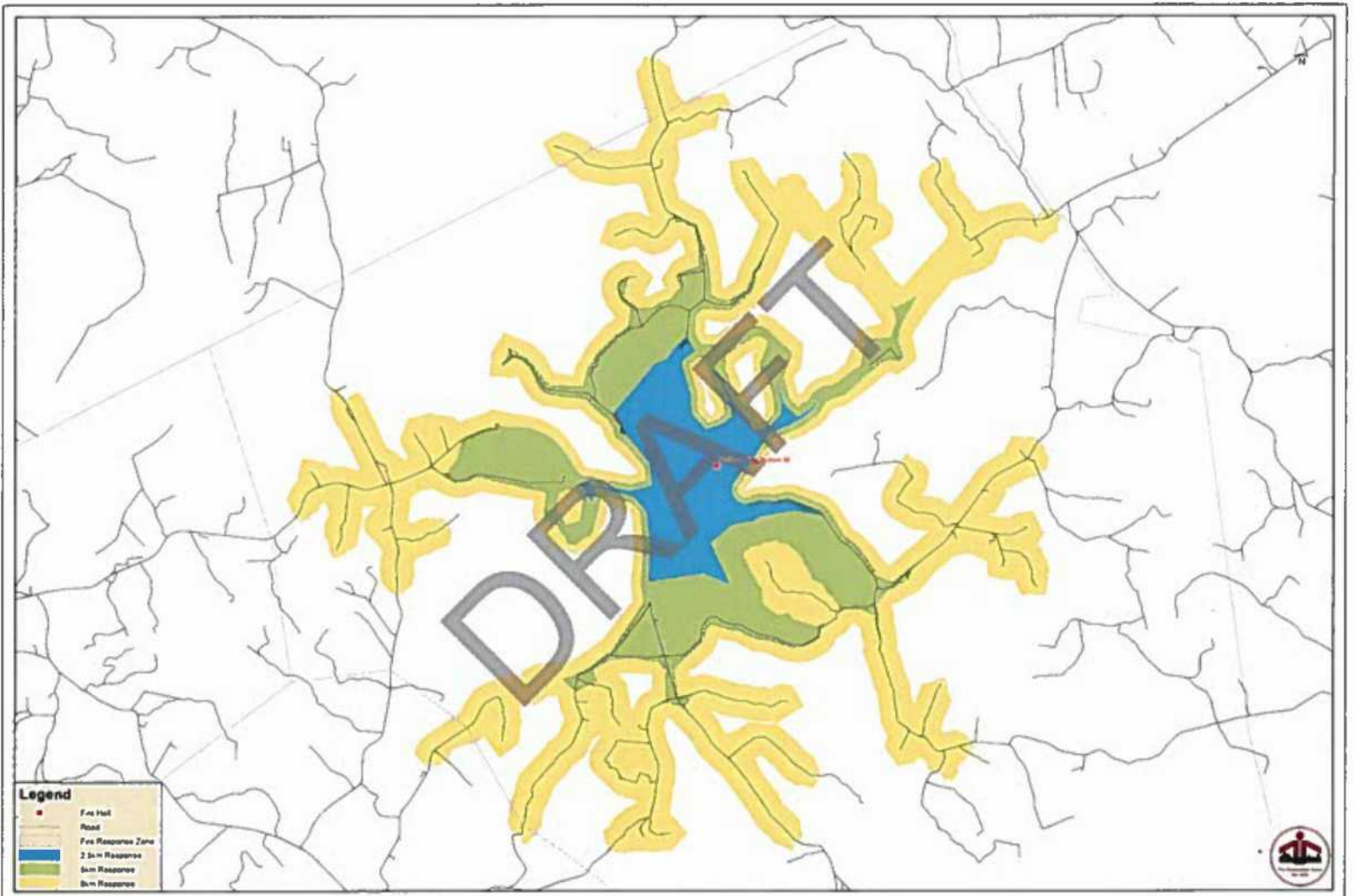
The station building construction is composed of wood paneling with an asphalt shingle roof. The station is two stories with two apparatus bays. Building code violations were noted in the overall layout of the building.



The tarmac outside the station is an asphalt covered area which extends from the bay door to the street. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

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- Legend**
- Fire Hall
 - Road
 - Fire Response Zone
 - 2.5 km Response
 - 5 km Response
 - 8 km Response

Figure 1 - 2.5/5/8km Response from Fire Station 38
 Scale = 1:20,000

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities in Station 38 are adequate to meet the needs of the fire fighters.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

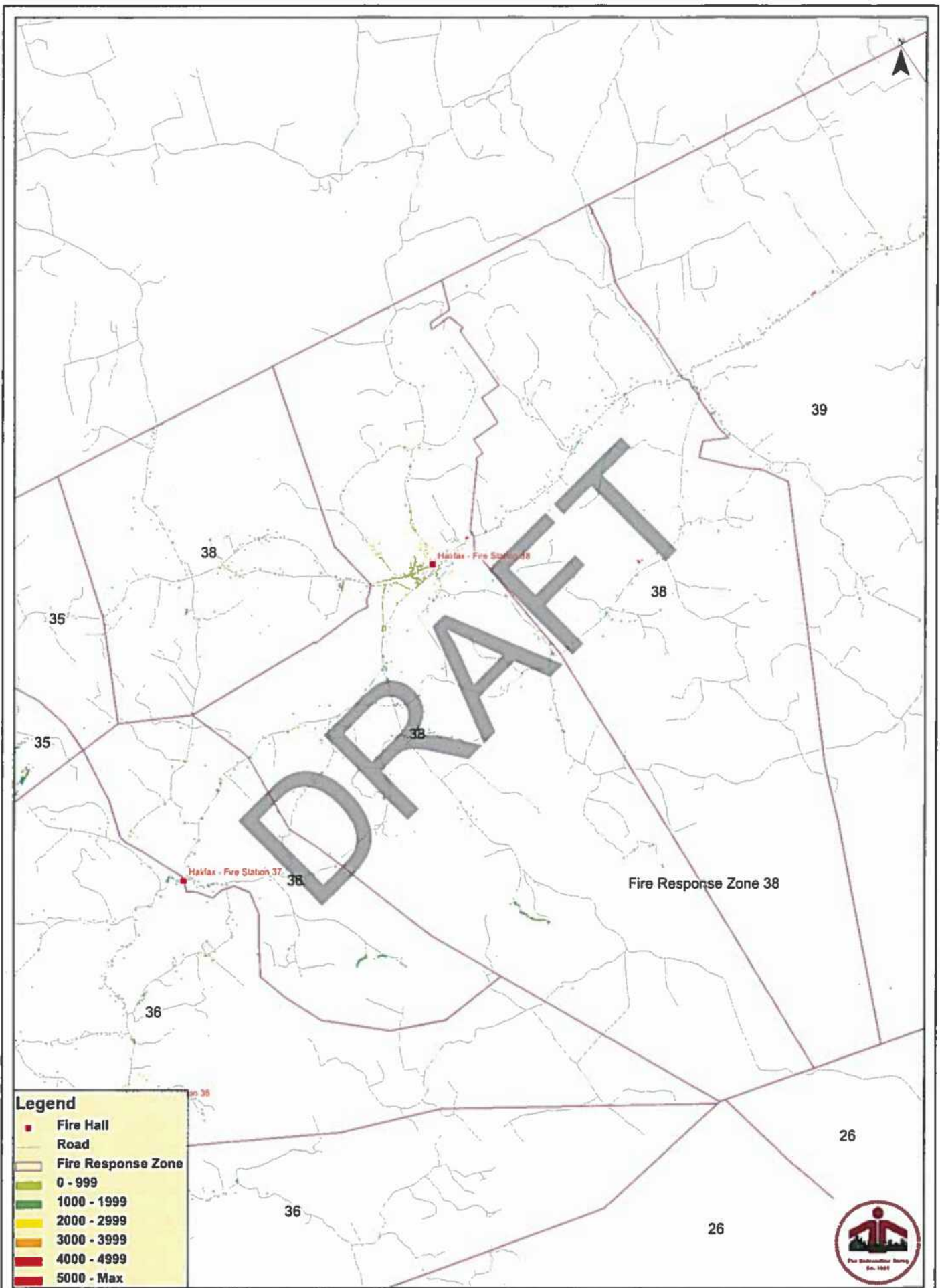
Community Risk Profile – Response Zone

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 712 Required Fire Flows were calculated for Response Zone 38 as shown in Table 1 and Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 38

RFF Range	No. of RFF points
0-999 IGPM	207
1,000-1,999 IGPM	478
2,000-2,999 IGPM	20
3,000-3,999 IGPM	5
4,000-4,999 IGPM	2
>=5,000 IGPM	0





The Basic Fire Flows assigned for Station 38 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited to large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response zone 38 is based on the 95th percentile which is 1,700 imperial gallons per minute.

Table 2 Basic Fire Flows for HRM Response Zone 38

Total RFF Points	712	
	IGPM	L/s
90th Percentile	1,000	75.80
95th Percentile	1,700	128.86
Max	4,400	333.52
5th highest	3,200	242.56

Apparatus and Personnel

Based on the Basic Fire Flow of 1,700 IGPM, the benchmark number of apparatus required for Fire Station 38 is one Engine apparatus. Station 38 is equipped with one Engine. Standard staffing for Station 38 is 18 volunteers and an E-Platoon of 4 paid during daytime hours, which allows the station to meet the minimum initial response of four to six fire fighters available to respond on first alarms.

Fire Calls

In the period from January 2010 until September 2013 Station 38 had 202 emergency calls with the breakdown as described in Table 3 and Figure 3 and 4 below. Figure 5 is a geographic display of the emergency calls responded to from Station 38.

The majority of incidents responded to by Station 38 were Medical calls at 46.5% of the total call volume.

Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls that could not be identified.



Table 3 Emergency calls by Incident Type

Call by type			
Type	Total	Year Average	Percentage (%)
Fire	38	10	18.81
False alarm	29	8	14.36
Smoke	6	2	2.97
Motor Vehicle Accident	17	5	8.42
Oil or Gas spill	0	0	0.00
Other	7	2	3.47
Rescue	1	0	0.50
Med Assist	94	25	46.53
Coding	10	3	4.95

Figure 3 Emergency Calls by Incident Type (2010-2013)

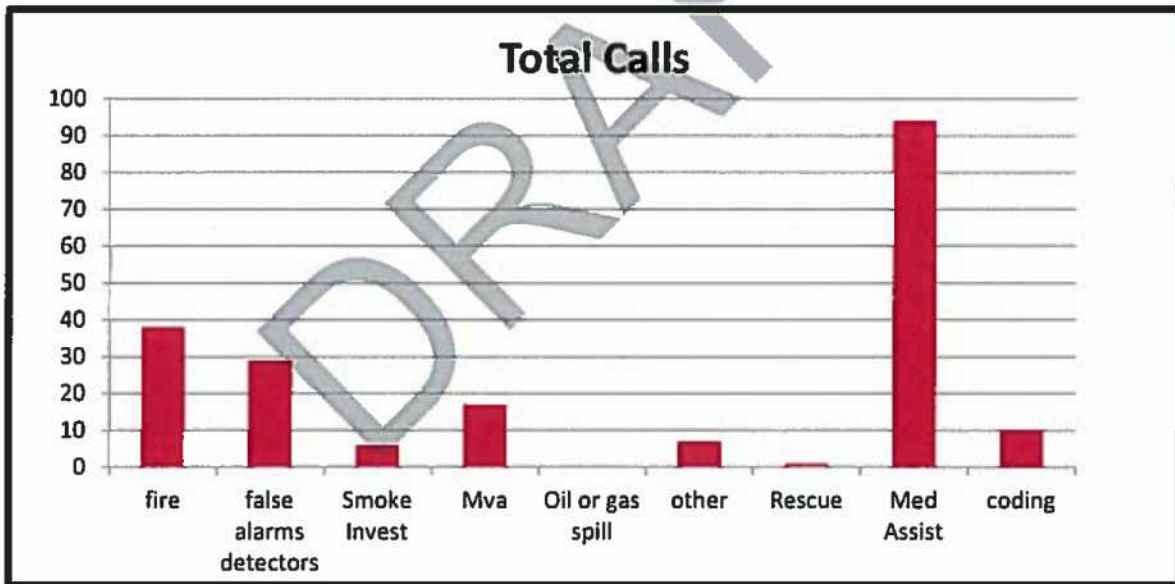


Figure 4 Percentage of Calls by Incident Type (2010-2013)

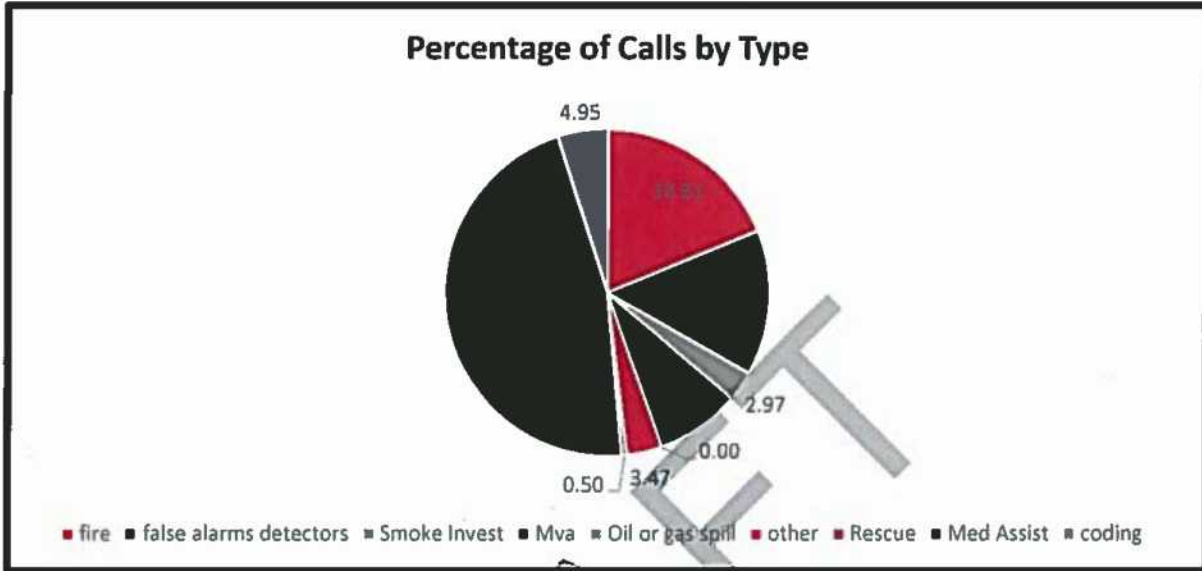
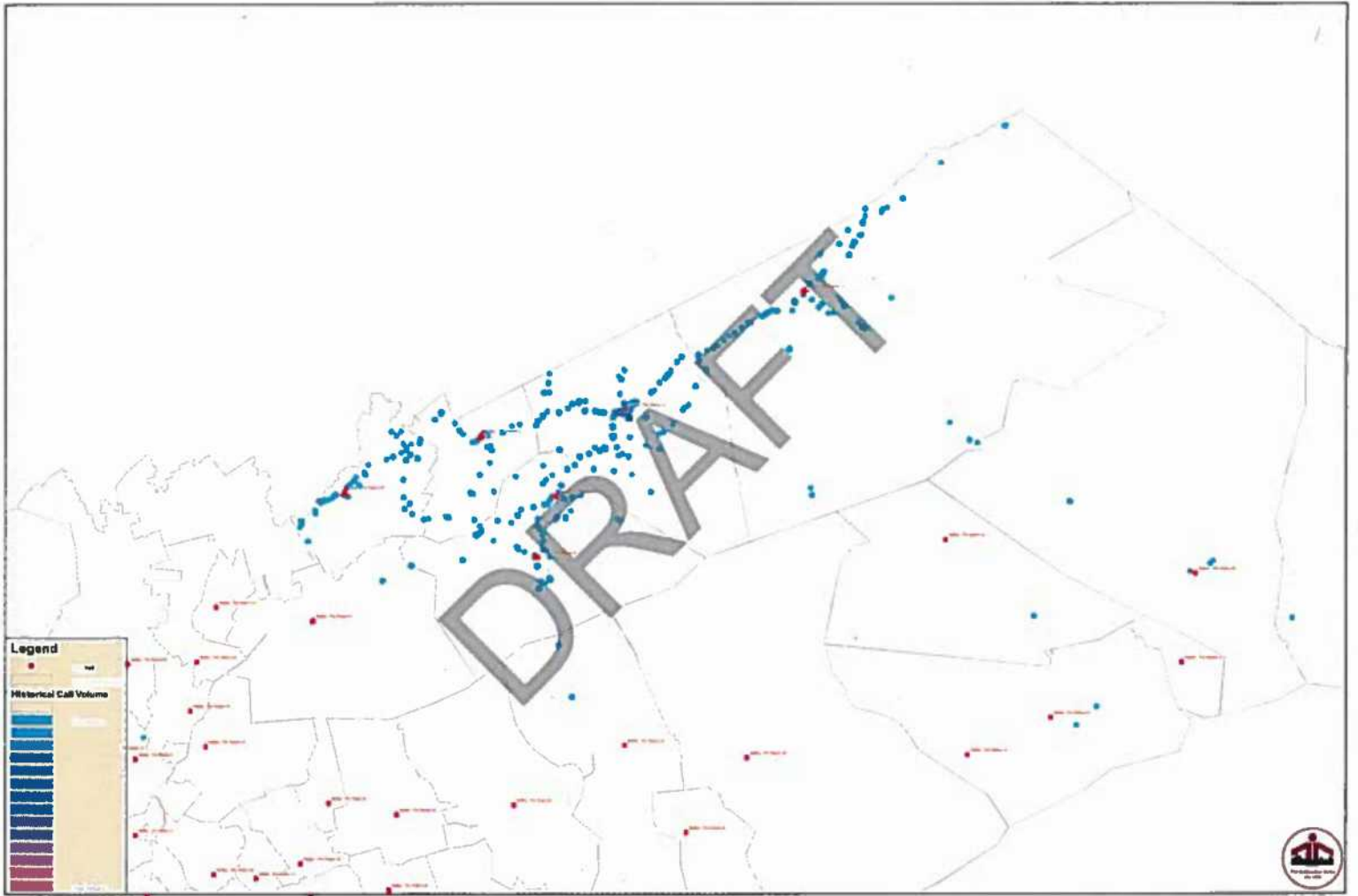


Table 4 is a breakdown of the fire calls by time of day for Station 38. The bulk of the calls are daytime and evening responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	24	11.9%
Daytime	0700 – 1659	119	58.9%
Evening	1700 – 2359	57	28.2%





Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 38 was assigned a Public Fire Protection Classification of 8 and Dwelling Protection Grade 3B.

Recommendations

- Composite staffing should be maintained at Station 38. The level of response provided by the volunteer and E-platoon staffing is adequate for the level of risk and demand (number of calls and call types) in Station 38's response area.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 39

14 Highway 336, Upper Musquodoboit



Station 39 is located in the community of Upper Musquodoboit in the HRM, off of Highway 336. Figure 1 shows the current 2.5km, 5km and 8km response coverage area for Station 39. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows. The green area (5km coverage) represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area (8km coverage) represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by 12 volunteer fire fighters and houses an Engine, Tanker and a Rescue vehicle.



Building and Tarmac

The station building is constructed of steel frame and metal cladding with an asphalt shingle roof.

The tarmac outside the station is an asphalt covered area which extends from the bay door to the street. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

Facilities

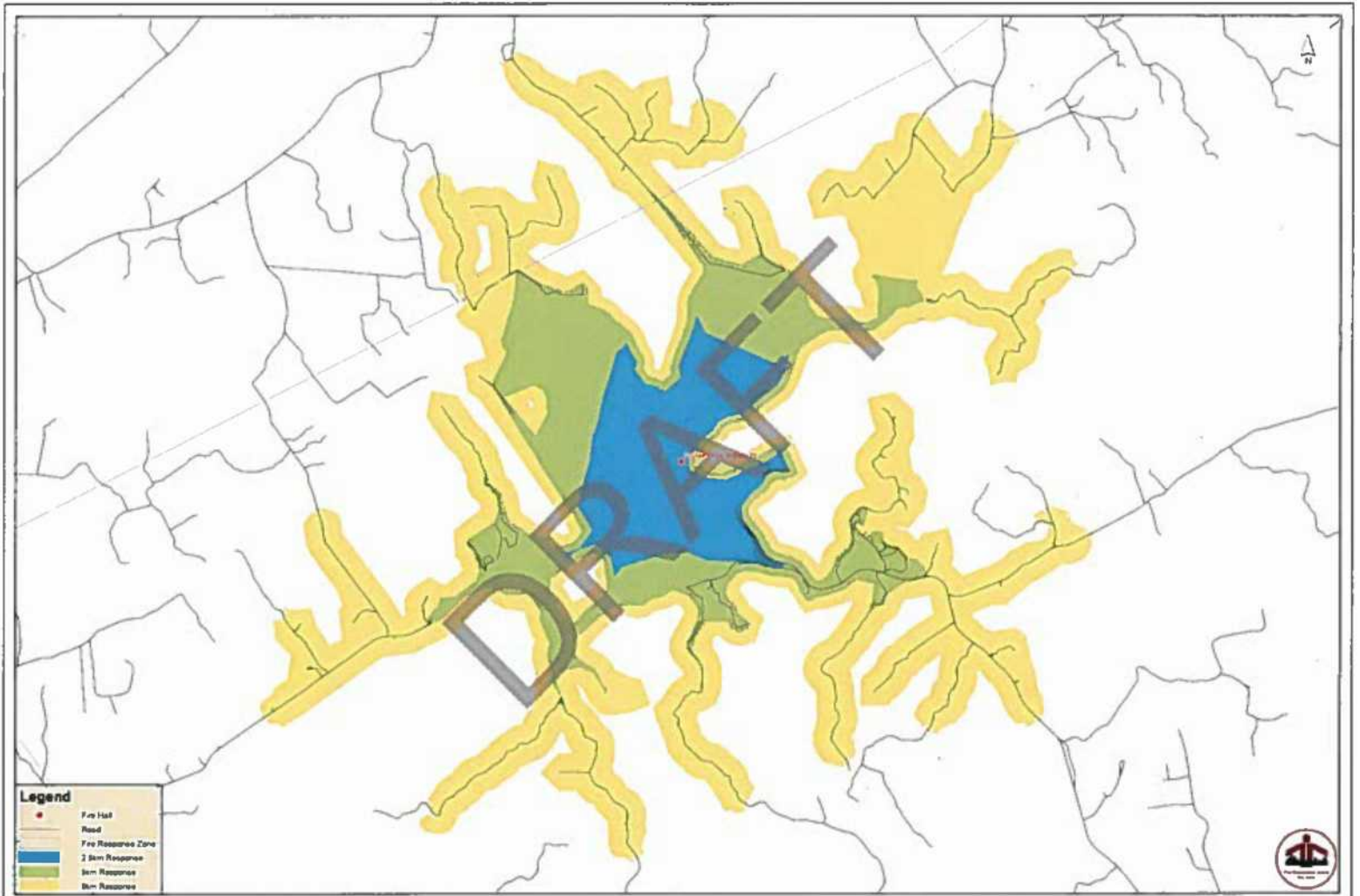
Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities in Station 39 are adequate to meet the needs of the fire fighters.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

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Legend

- Fire Hall
- Road
- Fire Response Zone
- 2 km Response
- 3 km Response
- 5 km Response

Figure 1 - 2.5/5km Response from Fire Station 38

Scale = 1:18,000

Regional Municipality of Halifax



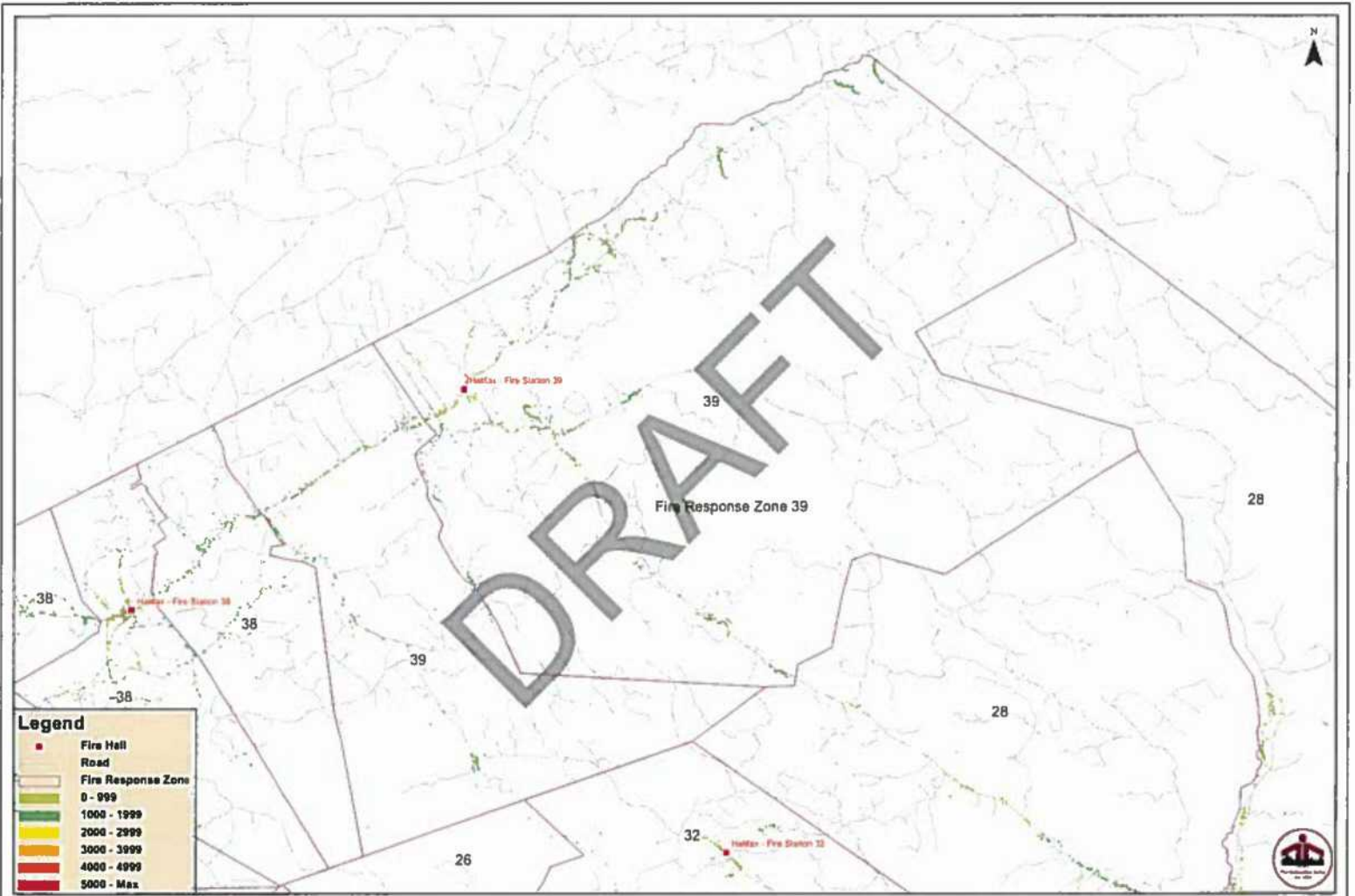
Community Risk Profile – Response Zone 39

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 950 Required Fire Flows were calculated for Response Zone 39 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 39

RFF Range	No. of RFF points
0-999 IGPM	169
1000-1999 IGPM	767
2000-2999 IGPM	7
3000-3999 IGPM	4
4000-4999 IGPM	3
>=5000 IGPM	0





The Basic Fire Flows assigned for Station 39 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response zone 39 is based on the 95th percentile which is 1,000 imperial gallons per minute.

Table 2 Basic Fire Flows for HRM Response Zone 39

Total RFF Points	950	
	IGPM	L/s
90th Percentile	1,000	75.80
95th Percentile	1,000	75.80
Max	4,400	333.52
5th highest	3,200	242.56

Apparatus and Personnel

Based on the Basic Fire Flow of 1,000 IGPM, the benchmark number of apparatus required for Fire Station 39 is one Engine apparatus. Station 39 is equipped with one Engine. Standard staffing for Station 39 is 12 volunteers; however response from this station is complemented by firefighters from Station 38. The roster level at Station 39 should be increased to a minimum of 15 volunteer firefighters.

Fire Calls

In the period from January 2010 until September 2013 Station 39 had 177 emergency calls with a breakdown by call type as described in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls that could not be identified.

The primary response for this station has been Medical calls at 44% of the total call volume.



Table 3 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year Average	Percentage (%)
Fire	49	13	27.68
False alarm	9	2	5.08
Smoke	4	1	2.26
Motor Vehicle Accidents	12	3	6.78
Oil or Gas spill	0	0	0.00
Other	16	4	9.04
Rescue	2	0.5	1.13
Medical Assist	78	21	44.07
Coding	7	2	3.96

Figure 3 Emergency Calls by Incident Type (2010-2013)

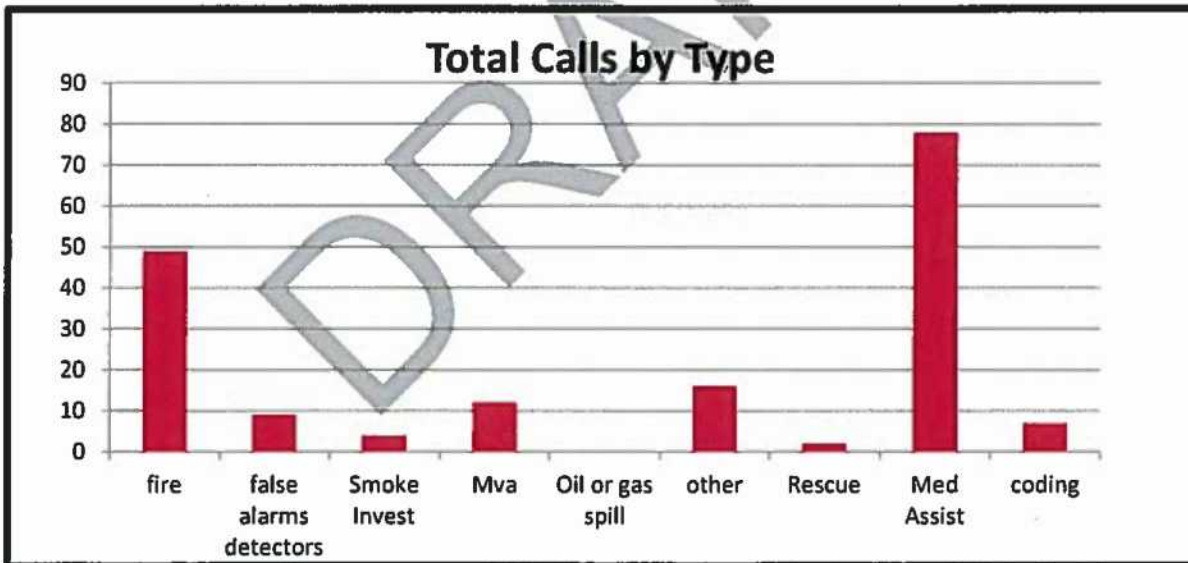


Figure 4 Percentage of Calls by Incident Type (2010-2013)

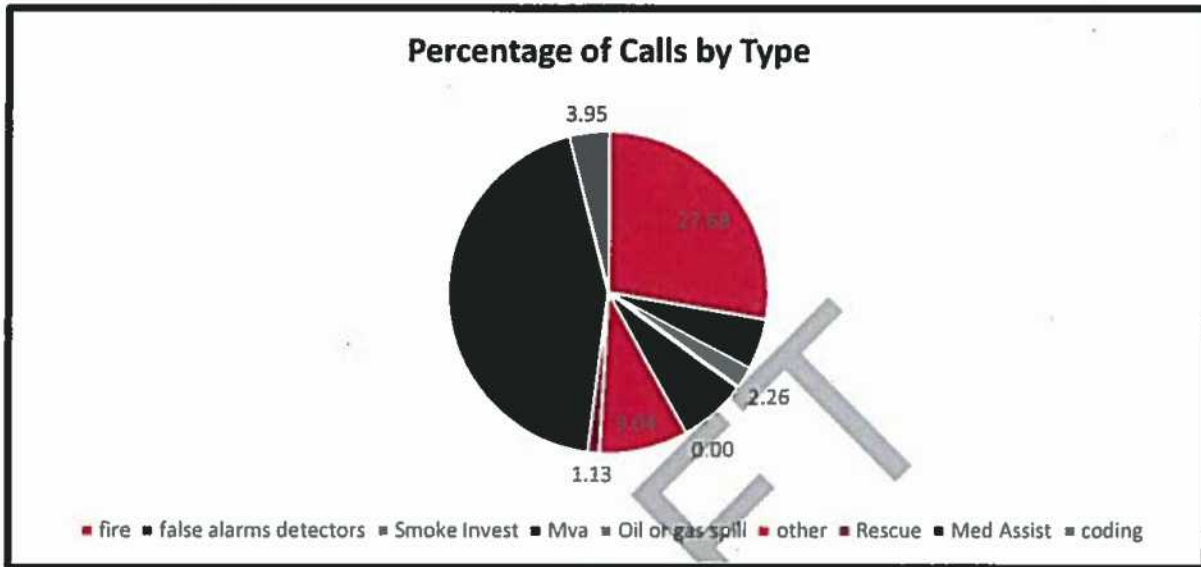


Table 4 is a breakdown of the fire calls by time of day for Station 39. The bulk of the calls are daytime and evening responses in this area.

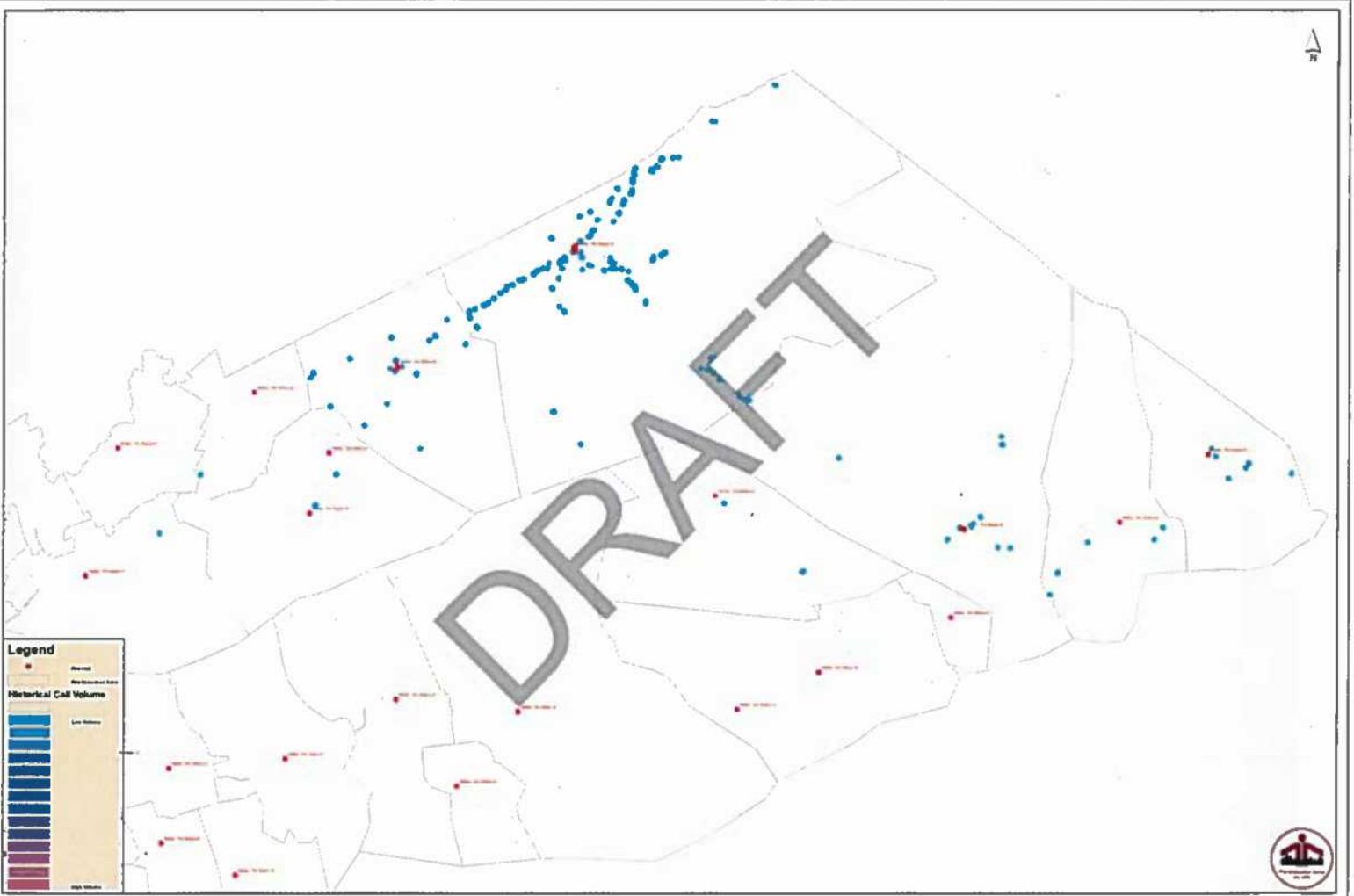
Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	00:00 – 06:59	23	13.0%
Daytime	07:00 – 16:59	95	53.7%
Evening	17:00 – 23:59	59	33.3%





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Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 39 was assigned a Public Fire Protection Classification of 10 and Dwelling Protection Grade 5.

Recommendations

- Recruit additional volunteers. Staffing at Station 39 is below the minimum 15 volunteers required on a fire department roster to provide adequate response and be recognized for fire insurance grading. Based on the number of emergency calls to Station 39, additional volunteers should be recruited to increase the staffing to a minimum of 15 volunteer firefighters. This will improve the overall fire insurance grades for Station 39.



STATION 40

36 Logan Road, Dutch Settlement



Station 40 is located in the rural community of Dutch Settlement in the HRM, off of Logan Road. Figure 1 shows the current 2.5km, 5km and 8km response coverage area for Station 40. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area (5km coverage) represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area (8km coverage) represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by 20 volunteer fire fighters and houses an Engine, Tanker and a Rescue vehicle.



Building and Tarmac

The station building is constructed of concrete panels with an asphalt built-up roof system.

The tarmac outside the station is an asphalt covered area which extends from the bay door to the street and covers approximately 6,900 square feet. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

Facilities

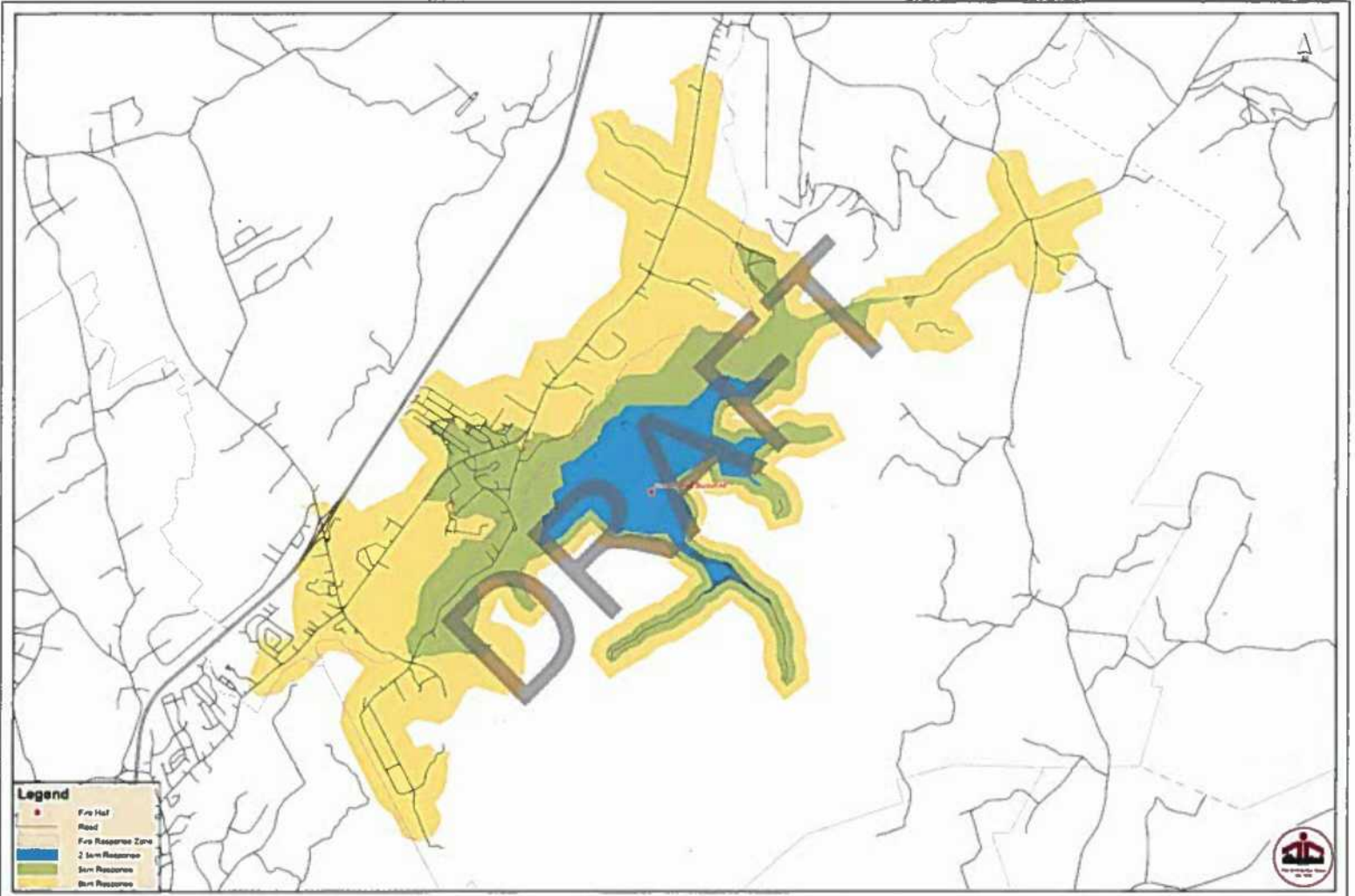
Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities in Station 40 are adequate to meet the needs of the fire fighters.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

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Legend

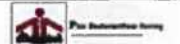
- Fire Hat
- Road
- Fire Response Zone
- 2 km Response Zone
- 5 km Response Zone



Regional Municipality of Halton

Figure 1 - 25/50km Response from Fire Station 40

Scale = 1:18,000



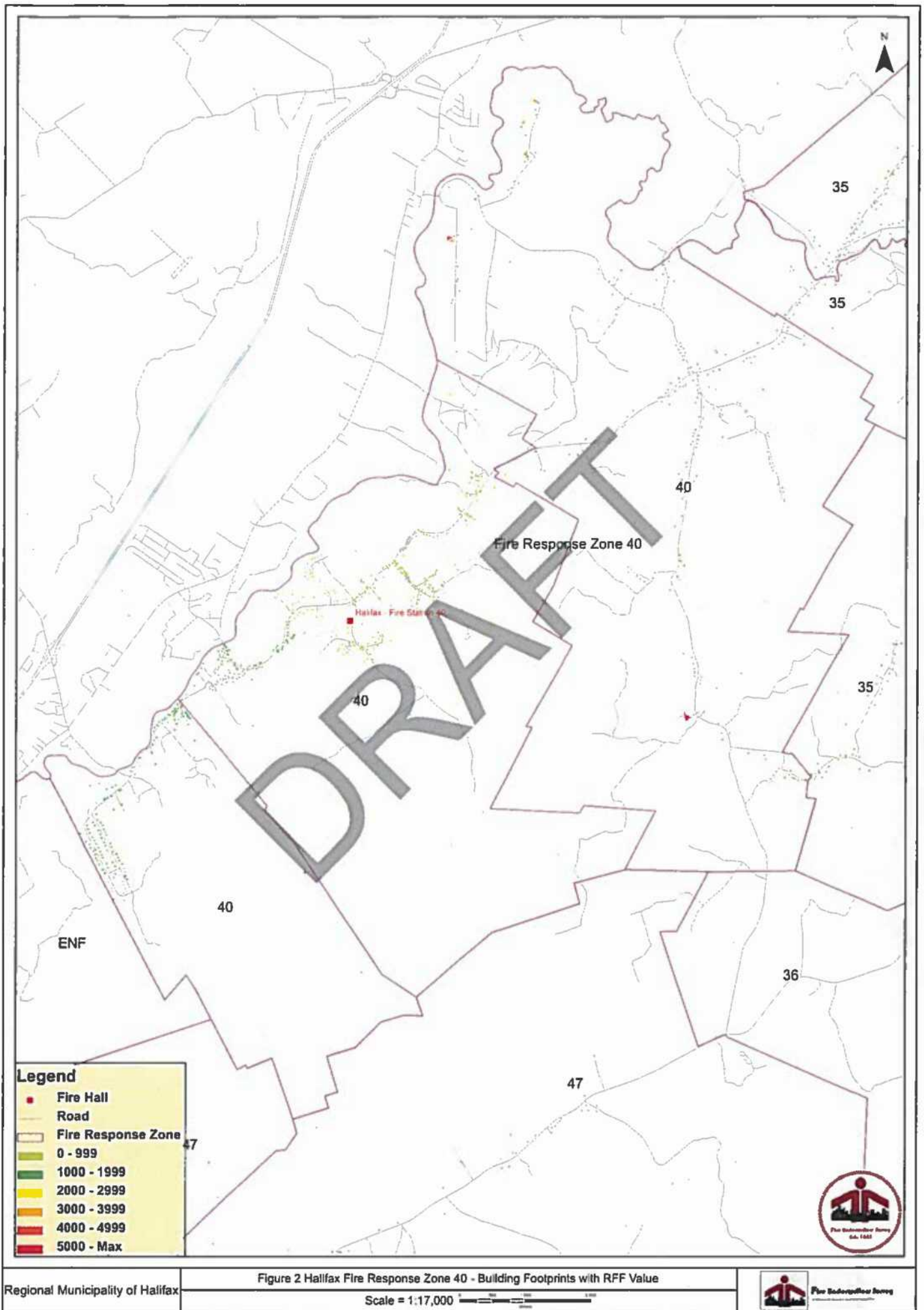
Community Risk Profile – Response Zone 40

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 785 Required Fire Flows were calculated for Response Zone 40 as shown in Table 1 and geographically in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 40

RFF Range	No. of RFF points
0-999 IGPM	307
1000-1999 IGPM	464
2000-2999 IGPM	8
3000-3999 IGPM	4
4000-4999 IGPM	1
>=5000 IGPM	1





The Basic Fire Flows assigned for Station 40 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response zone 40 is based on the 95th percentile which is 1,100 imperial gallons per minute.

Table 2 Basic Fire Flows for HRM Response Zone 40

Total RFF Points	785	
	IGPM	L/s
90th Percentile	1,000	75.80
95th Percentile	1,100	83.38
Max	5,100	386.58
5th highest	3,300	250.14

Apparatus and Personnel

Based on the Basic Fire Flow of 1,100 IGPM, the benchmark number of apparatus required for Fire Station 40 is one Engine apparatus. Station 40 is equipped with one Engine. Standard staffing for Station 40 is 20 volunteers, which allows the station to meet the minimum initial response of four to six fire fighters available to respond on first alarms.

Fire Calls

In the period from January 2010 until September 2013, Station 40 received a total of 228 emergency calls with a breakdown by call type as described in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls could not be identified. The year average was calculated for all calls over the 45 months reviewed.

The majority of calls to Station 40 were Medical emergencies at 43.4 percent of the total call volume.



Table 3 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year Average	Percentage (%)
Fire	35	9	15.35
False alarm	16	4	7.02
Smoke	0	0	0.00
Motor Vehicle Accident	28	7	12.28
Oil or Gas spill	0	0	0.00
Other	6	2	2.63
Rescue	0	0	0.00
Medical Assist	99	26	43.42
Coding	44	12	19.30

Figure 3 Emergency Calls by Incident Type (2010-2013)

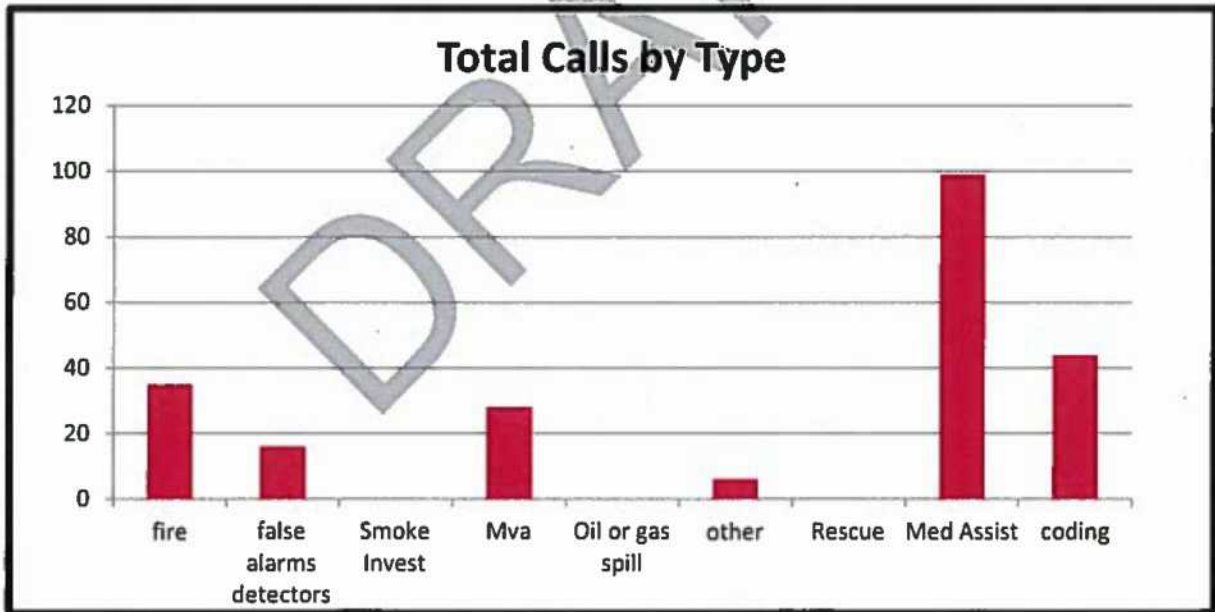


Figure 4 Percentage of Calls by Incident Type (2010-2013)

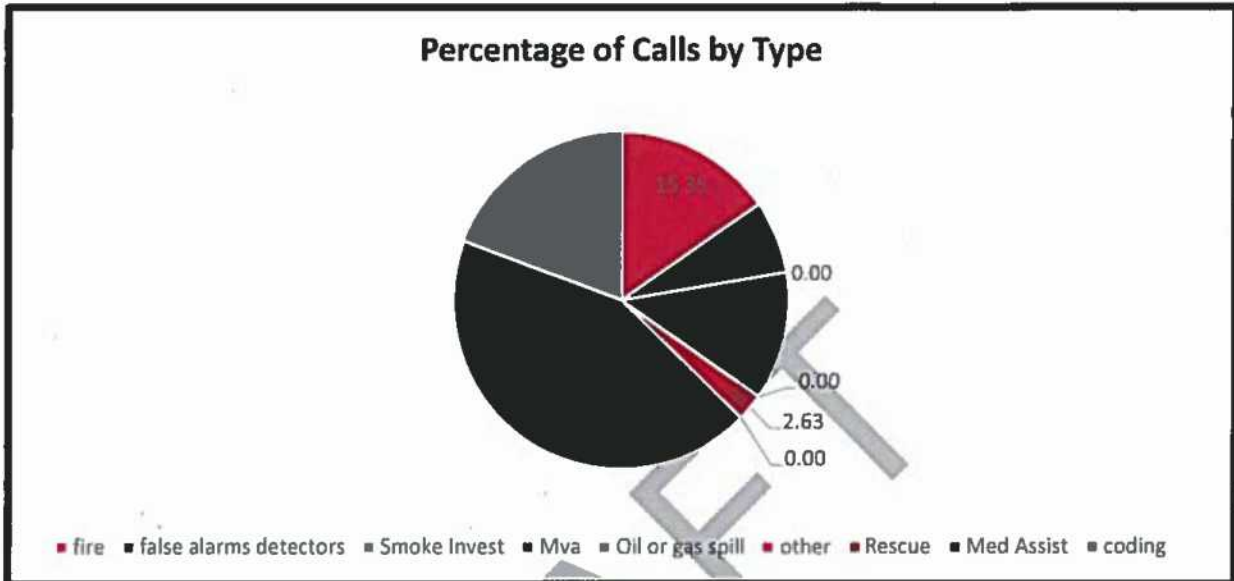
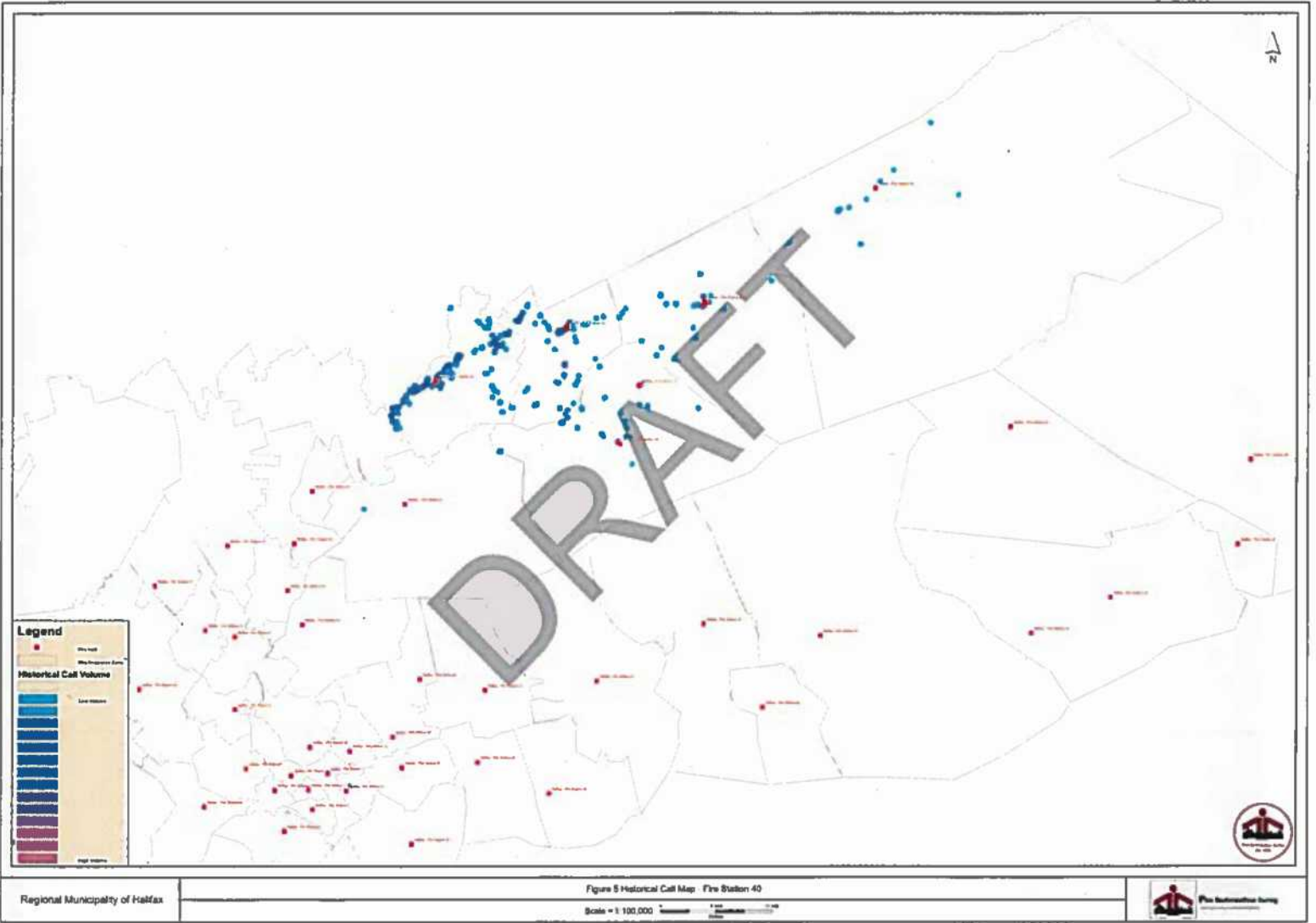


Table 4 is a breakdown of the fire calls by time of day for Station 40. The bulk of the calls are daytime and evening responses in this area. Station 40 has an excellent working relationship with the Municipality of East Hants Fire Service and has an automatic aid agreement in place for multiple station response to Response Zone 40.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	00:00 – 06:59	44	19.3%
Daytime	07:00 – 16:59	107	46.7%
Evening	17:00 – 23:59	77	34.0%





Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 40 was assigned a Public Fire Protection Classification of 8 and Dwelling Protection Grade 3B.

Recommendations

- Station 40 should remain as an active volunteer station. Based on the number of calls and call types, the volunteer staffing provides adequate response for the level of risk and demand in the fire response zone.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



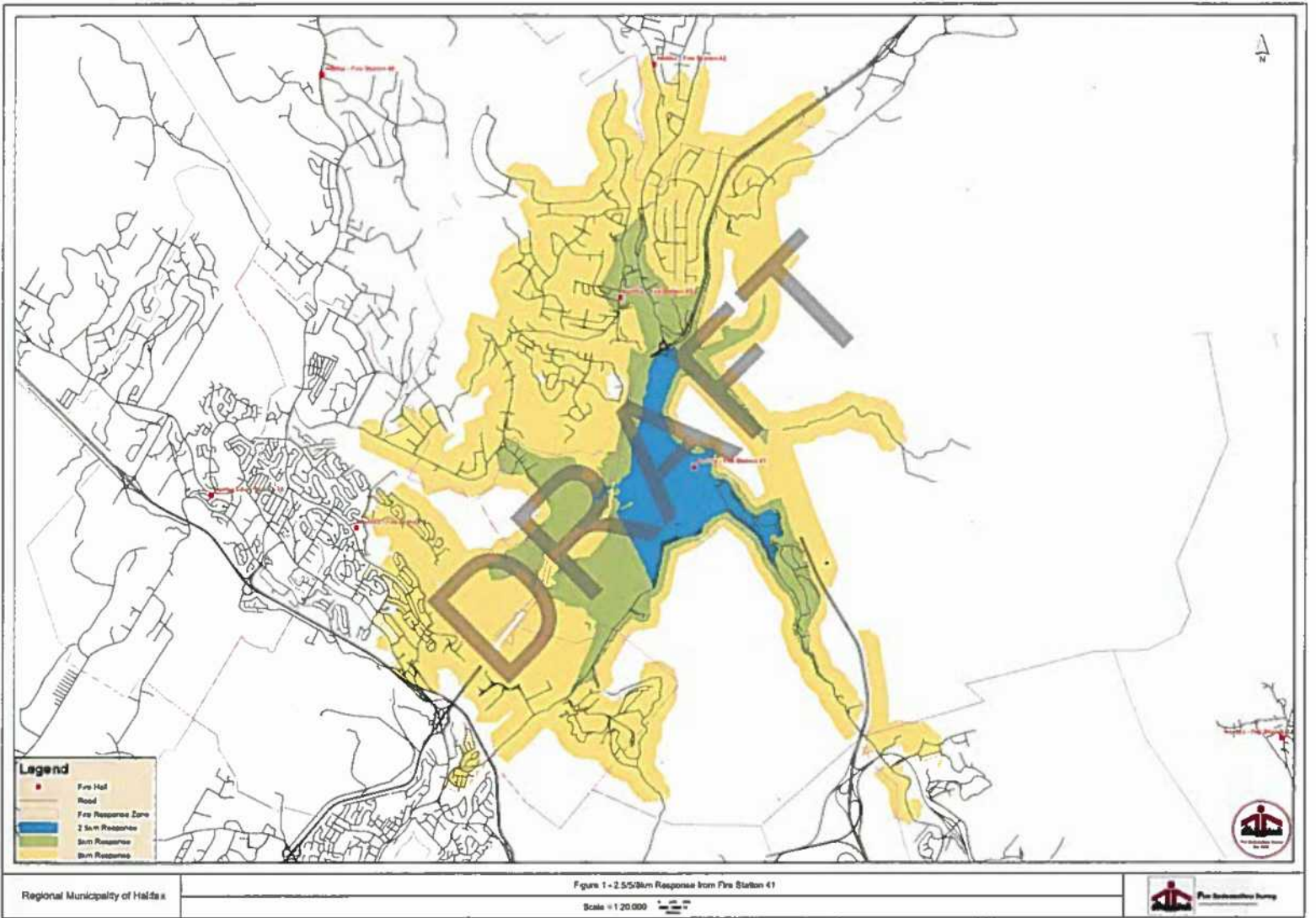
STATION 41
2433 Highway 2



Station 41 is located in the community of Waverley in the Halifax Regional Municipality off of Highway No. 2. Figure 1 shows the current 2.5km, 5km and 8km response coverage area for Station 41. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is currently staffed by 15 volunteers and houses one Engine, one Quint, a Tanker, and a Rescue vehicle.





Building and Tarmac

The station building is concrete with vinyl siding and an aluminum roof. The station is one story with a mezzanine and is approximately 8,600 square feet. The tarmac outside the station is an asphalt covered area which extends from the bay door to the street and parking lot, and covers approximately 4,300 square feet. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. Overall the facilities in this station were found to be in poor condition.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

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Community Risk Profile – Response Zone 41

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 1,487 Required Fire Flows were calculated for Response Zone 41 as shown in Figure 2 below. The Basic Fire Flows assigned for Station 41 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for this zone is based on the 5th Highest Required Fire Flow value which is 3,600 IGPM.

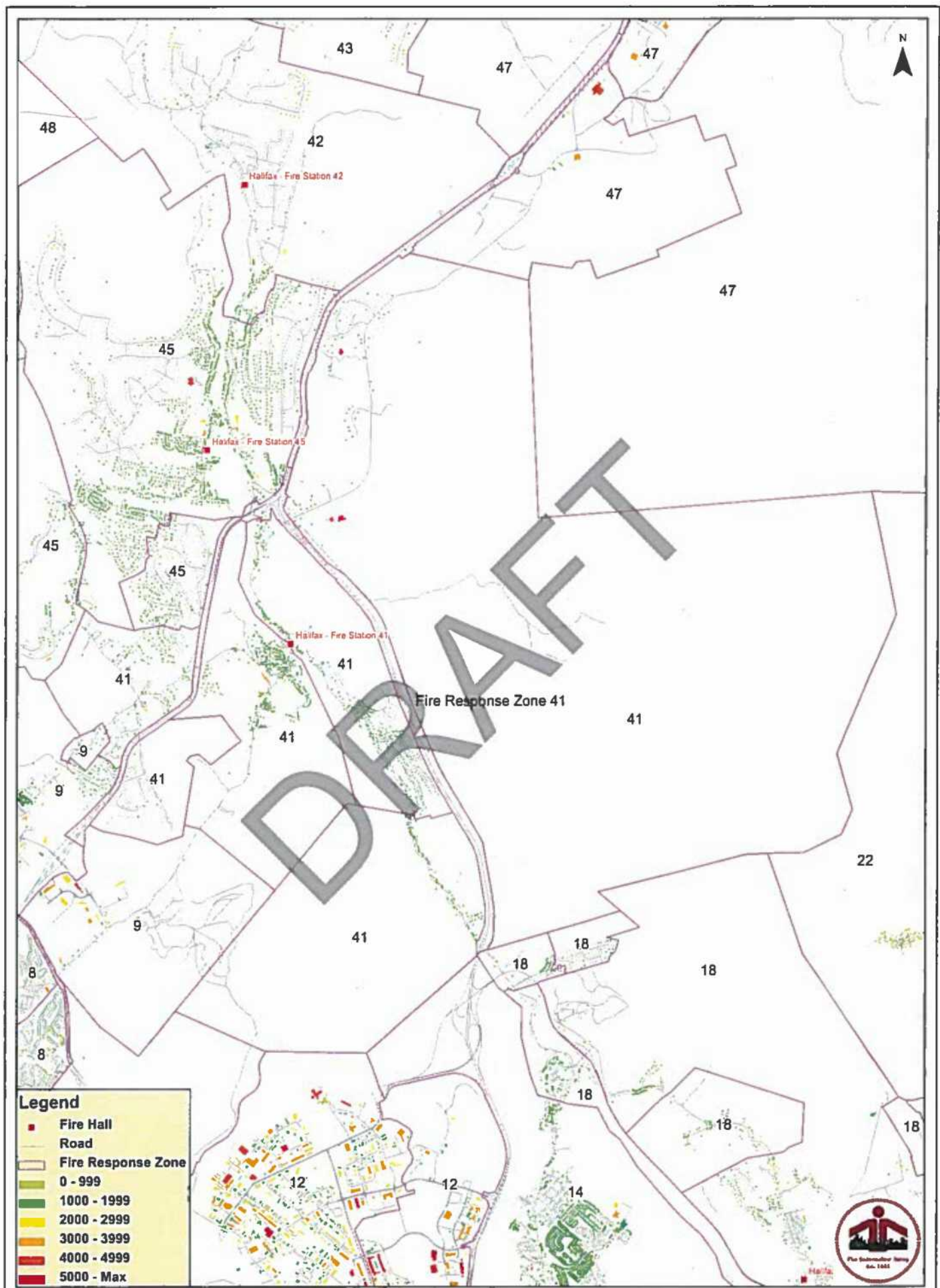
Table 1 Required Fire Flow ranges in Response Zone 41

RFF Range	No. of RFF points
0-999 IGPM	144
1000-1999 IGPM	1,330
2000-2999 IGPM	8
3000-3999 IGPM	2
4000-4999 IGPM	1
>=5000 IGPM	2

Table 2 Basic Fire Flows for HRM Response Zone 41

Total RFF Points	1,487	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,400	106.12
Max	5,900	447.22
5th highest	3,600	272.88





Apparatus and Personnel

Based on the Basic Fire Flow of 3,600 IGPM, the benchmark number of apparatus required for Fire Station 41 is four Engine apparatus. Station 41 is equipped with one Engine and a Quint. Standard staffing for Station 41 is 15 volunteers, which meets the minimum of 15 volunteers firefighters required on a fire department roster to provide adequate response and be recognized for fire insurance grading purposes.

Fire Calls

In the period from January 2010 until September 2013, Station 41 received 462 emergency calls with a breakdown by call type as shown in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or those for which the types of calls could not be identified. The year average was calculated for all calls over the 45 months reviewed.

The majority of calls to Station 41 were Medical emergencies at 23.8 percent of the total call volume.

Table 3 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year Average	Percentage (%)
Fire	64	17	13.85
False alarm	38	10	8.23
Smoke	31	8	6.71
Motor Vehicle Accident	97	26	21.00
Oil or Gas spill	0	0	0.00
Other	3	1	0.65
Rescue	3	1	0.65
Medical Assist.	110	29	23.81
Coding	116	31	25.10



Figure 3 Emergency Calls by Incident Type (2010-2013)

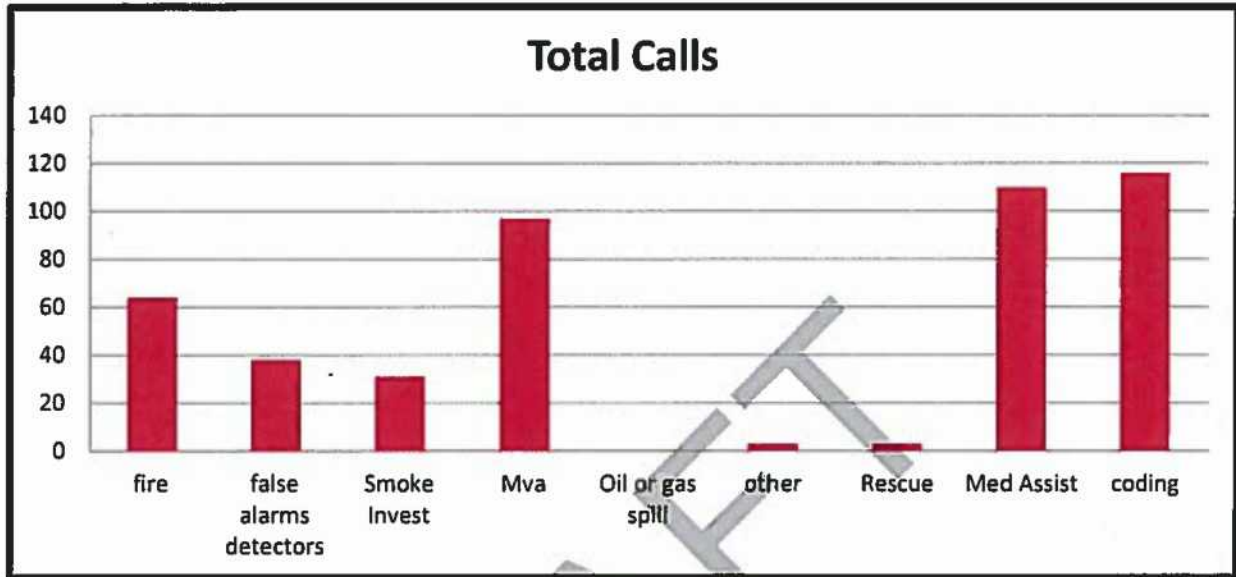


Figure 4 Percentage of Calls by Incident Type (2010-2013)

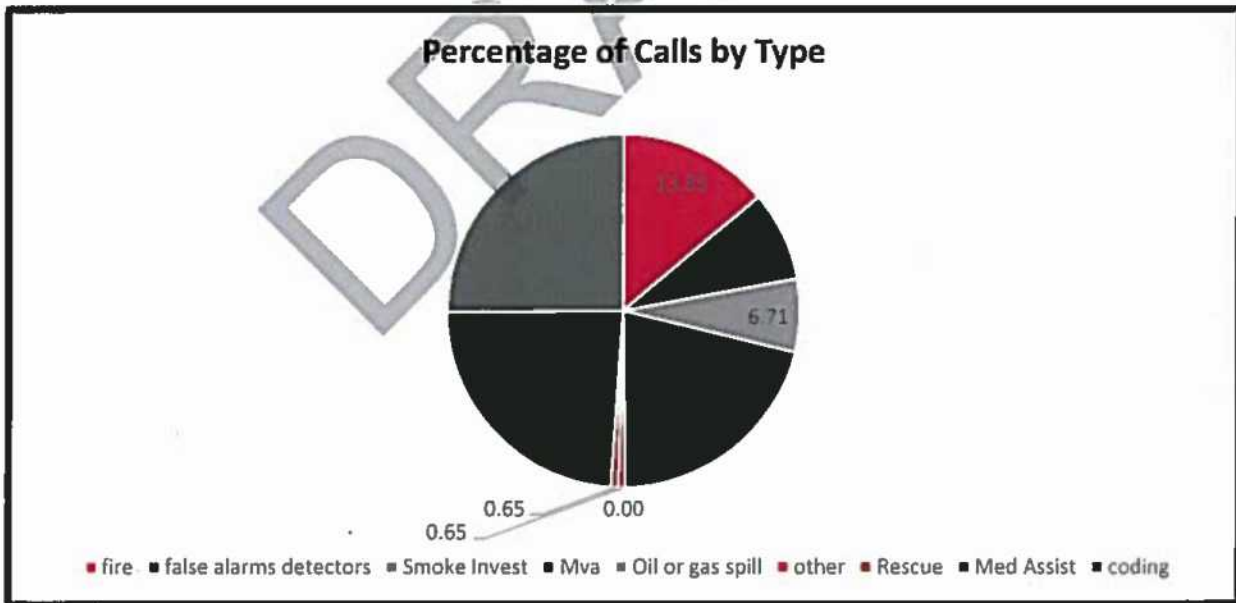


Table 4 is a breakdown of the fire calls by time of day for Station 41. The bulk of the calls are daytime and evening responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	00:00 – 06:59	62	13.4%
Daytime	07:00 – 16:59	208	45.0%
Evening	17:00 – 23:59	192	41.6%

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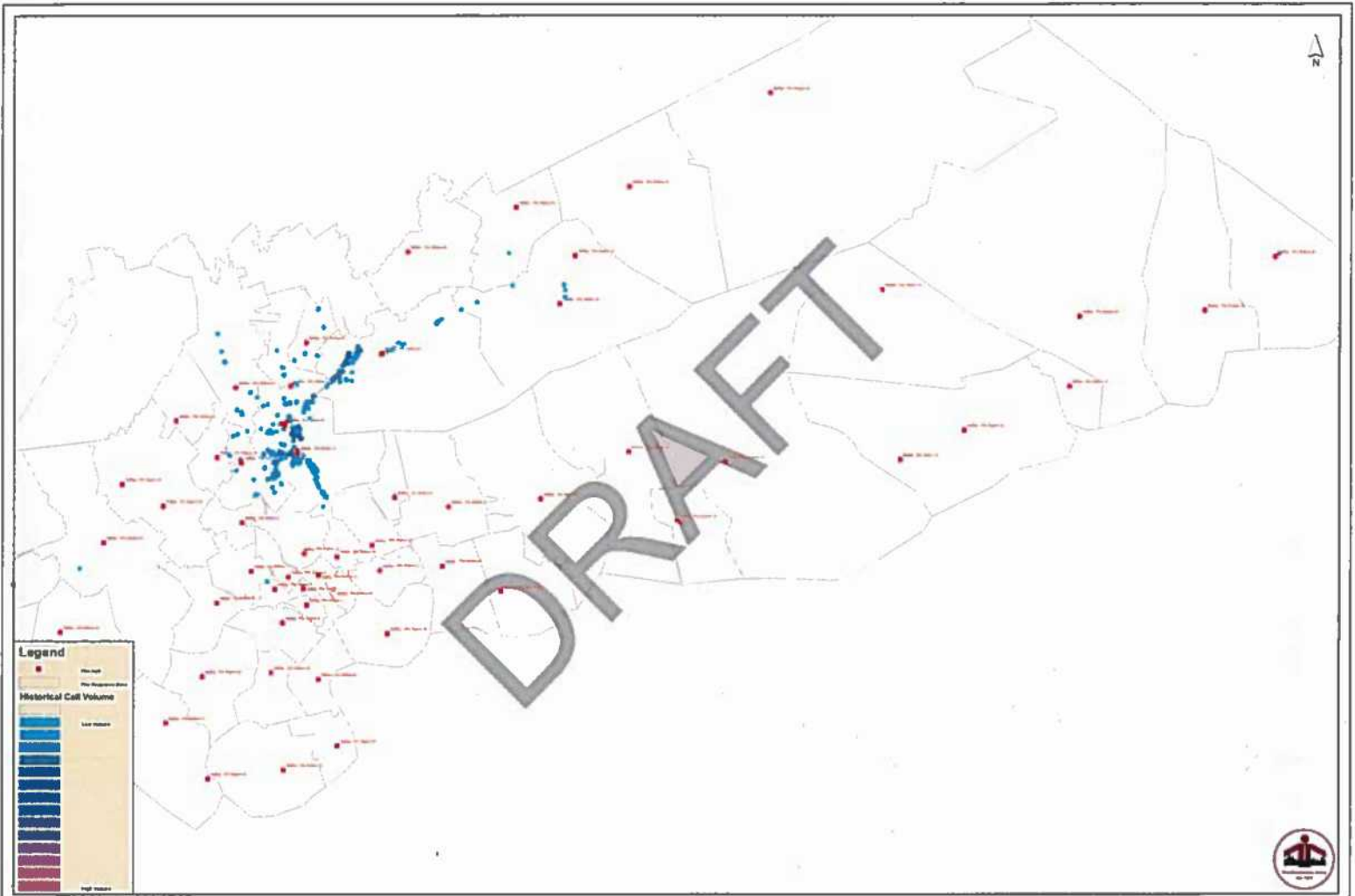


Figure 5 Historical Call Map - Fire Station 41

Scale = 1:125,000

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 41 was assigned a Public Fire Protection Classification of 8 and Dwelling Protection Grade 3B.

Recommendations

- Increase the number of volunteers at Station 41 to a minimum of 20 firefighters. Recruitment strategies should be implemented at this station to increase the number of volunteers and improve the available fire force. The level of risk (Basic Fire Flow) is relatively higher in Station 41's response zone and the available fire force should be proportionate to the level of risk in the community.
- If the roster level falls below the minimum of 15 volunteer firefighters and recruitment strategies are unsuccessful, full-time staffing should be assigned to this station to improve response and maintain the fire insurance grading recognition for the station. However it was noted that the station facilities are not adequate to meet the needs of full time staff. To accommodate full-time staff, improvements to station facilities will be required. The station should be equipped with male and female washrooms, recreational areas, adequate training space, proper storage areas and maintenance space.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 42
4132 Highway 2



Station 42 is located in the community of Wellington in the Halifax Regional Municipality off of Highway 2. Figure 1 shows the current 2.5km, 5km and 8km response coverage area for Station 42. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is currently staffed by 17 volunteers and houses one Engine, a Rescue boat and a Tow Vehicle.



Building and Tarmac

The station building is wood framed with vinyl siding and an aluminum roof. The station is one story and is approximately 12,100 square feet. The tarmac outside the station is an asphalt covered area which extends from the bay door to the street and covers approximately 1,800 square feet. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. Overall the facilities in this Station were found to be in poor condition. The station facilities are not adequate to meet the needs of the staff. Fire stations should be equipped with recreational areas, adequate training space, proper storage areas and maintenance space.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.



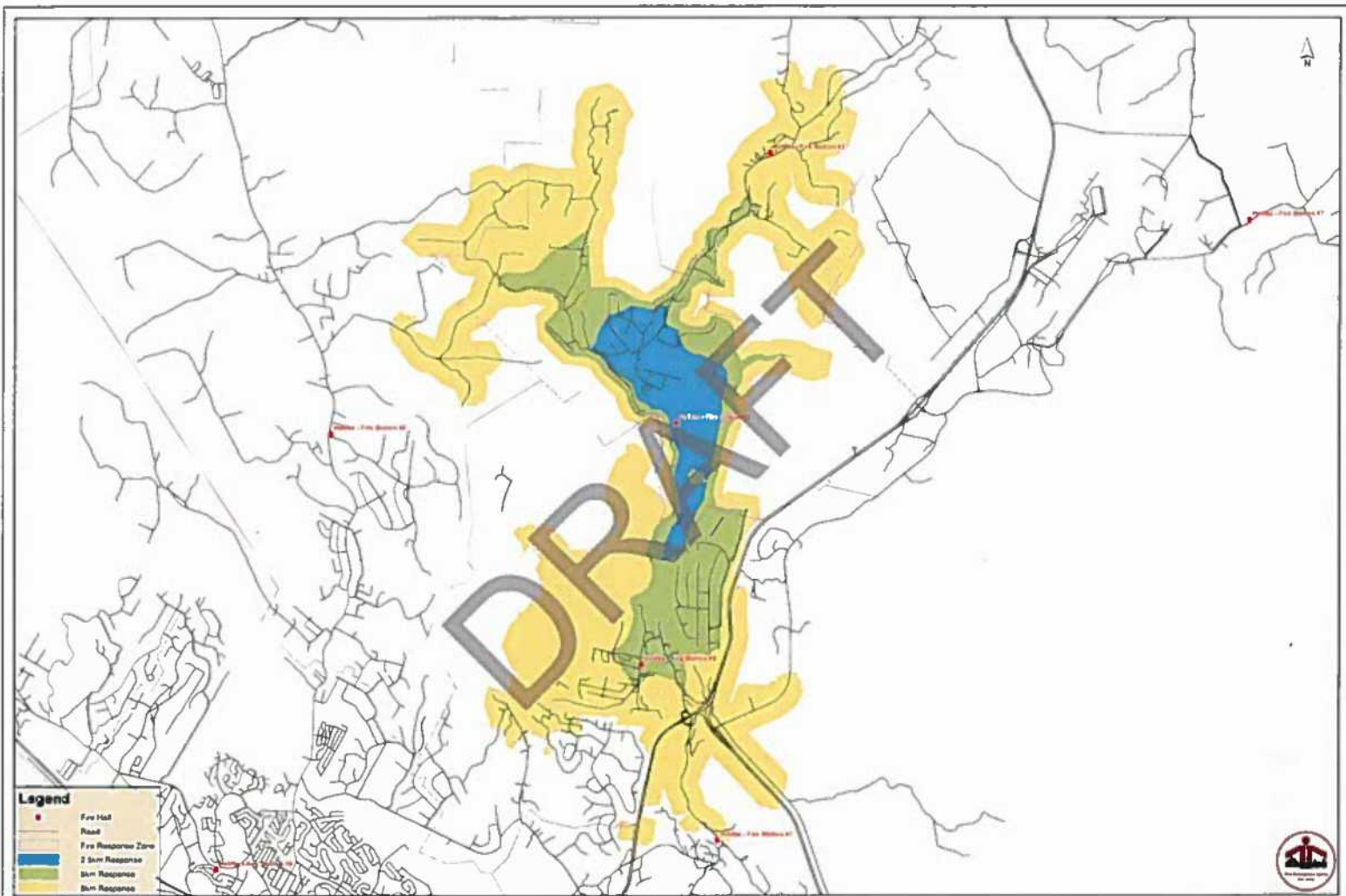


Figure 1 - 2.5/5/10km Response from Fire Station 42

Scale = 1:20,000

Community Risk Profile – Response Zone 42

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community’s fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 1,010 Required Fire Flows were calculated for Response Zone 42 as shown in Figure 2 below. The Basic Fire Flows assigned for Station 42 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for this zone is based on the 95th Percentile Required Fire Flow value which is 1,400 IGPM.

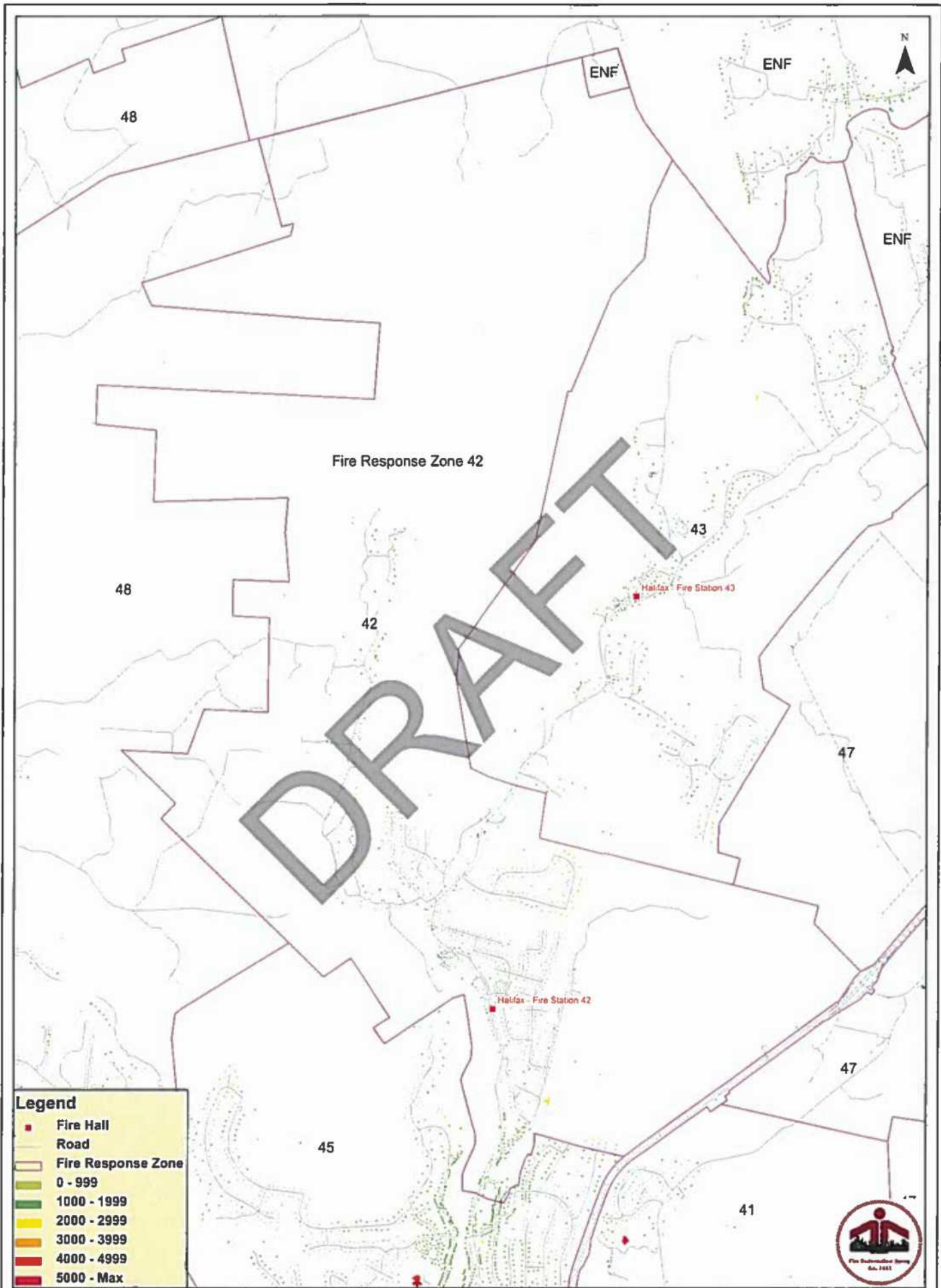
Table 1 Required Fire Flow ranges in Response Zone 42

RFF Range	No. of RFF points
0-999 IGPM	363
1000-1999 IGPM	643
2000-2999 IGPM	4
3000-3999 IGPM	0
4000-4999 IGPM	0
>=5000 IGPM	0

Table 2 Basic Fire Flows for HRM Response Zone 42

Total RFF Points	1,010	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,400	106.12
Max	2,200	166.76
5th highest	1,900	144.02





Legend

- Fire Hall
- Road
- Fire Response Zone
- 0 - 999
- 1000 - 1999
- 2000 - 2999
- 3000 - 3999
- 4000 - 4999
- 5000 - Max

Apparatus and Personnel

Based on the Basic Fire Flow of 1,400 IGPM, the benchmark number of apparatus required for Fire Station 42 is two Engine apparatus. Station 42 is equipped with one Engine. Standard staffing at Station 42 is 17 volunteers, which allows the station to meet the minimum initial response of four to six fire fighters available to respond on first alarms.

Fire Calls

In the period from January 2010 until September 2013 Station 42 had 246 emergency calls with a breakdown by call type as shown in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or those for which the type of call could not be identified. The year average was calculated for all calls over the 45 months reviewed.

The majority of calls to Station 42 were Medical emergencies at 49 percent of the total call volume.

Table 3 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year Average	Percentage (%)
Fire	36	10	14.63
False alarm	25	7	10.16
Smoke	10	3	4.07
Motor Vehicle Accident	19	5	7.72
Oil or Gas spill	0	0	0.00
Other	12	3	4.88
Rescue	2	1	0.81
Medical Assist	121	32	49.19
Coding	21	6	8.54



Figure 3 Emergency Calls by Incident Type (2010-2013)

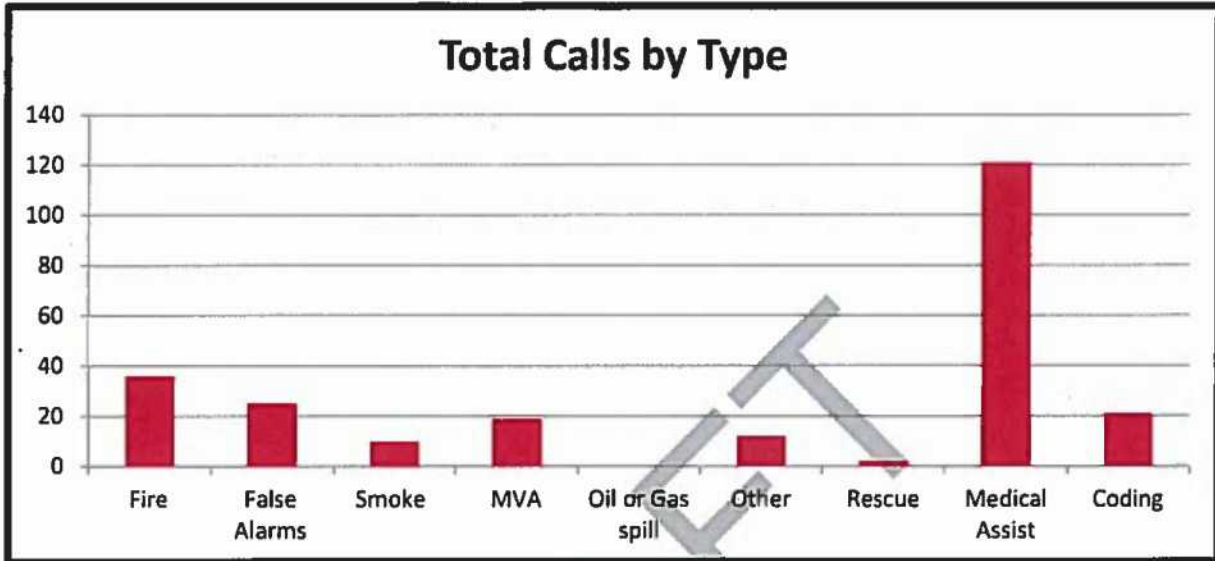


Figure 4 Percentage of Calls by Incident Type (2010-2013)

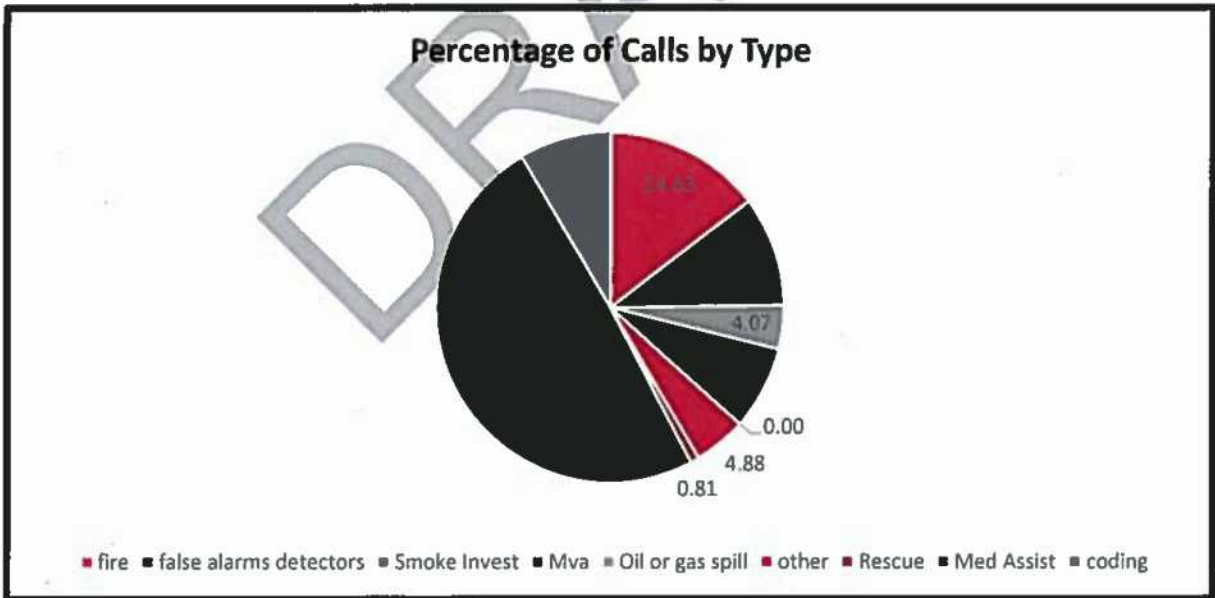


Table 4 is a breakdown of the fire calls by time of day for Station 42. The bulk of the calls are evening and daytime responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	00:00 – 06:59	38	15.4%
Daytime	07:00 – 16:59	101	41.1%
Evening	17:00 – 23:59	107	43.5%

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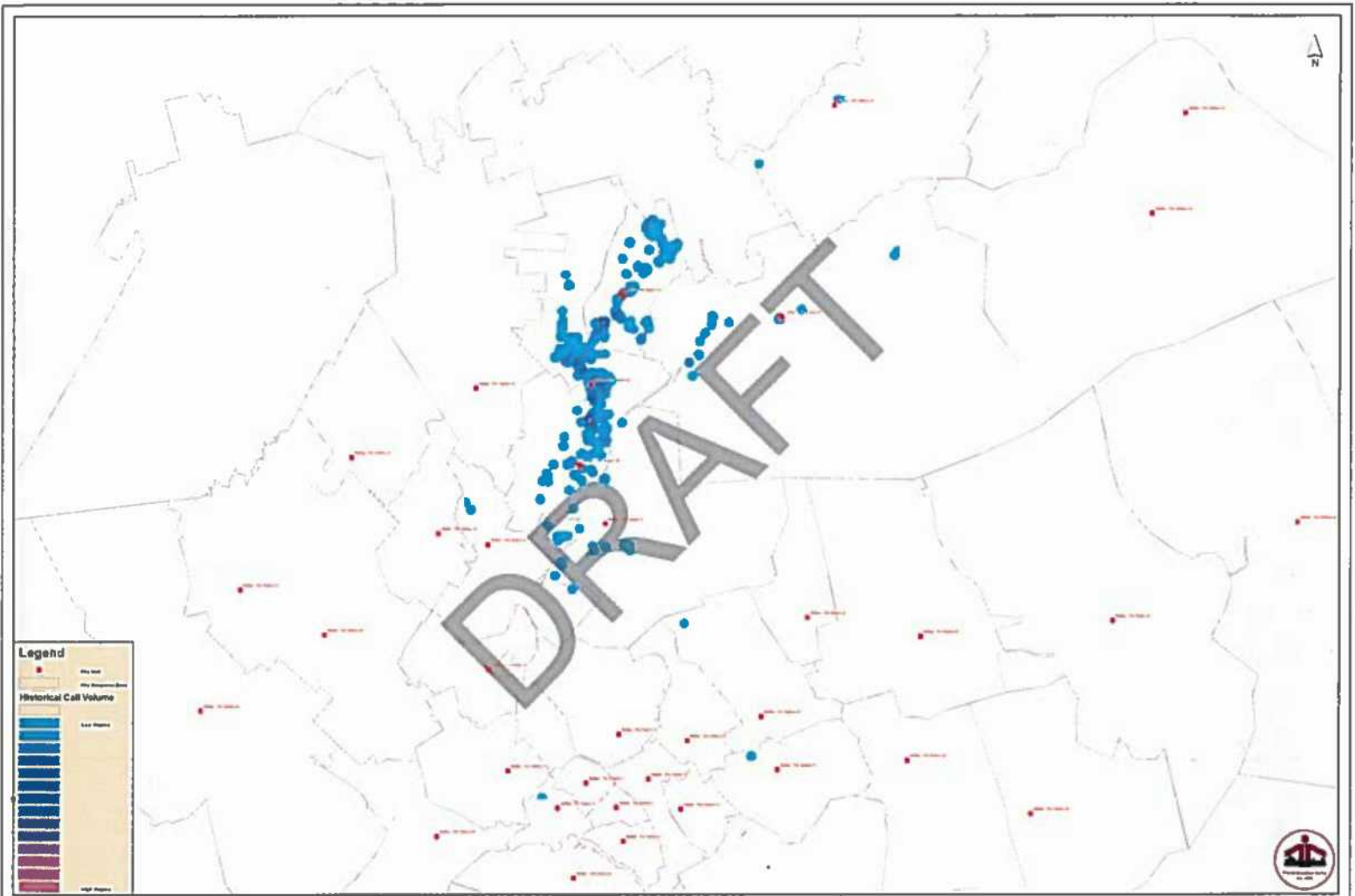


Figure 5 Historical Call Map - Fire Station 42

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 42 was assigned a Public Fire Protection Classification of 8 and Dwelling Protection Grade 3B.

Recommendations

- Station 42 should remain as an active volunteer station. Based on the number of calls and call types, the volunteer staffing provides adequate response for the level of risk and demand in the fire response zone.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 43
22 Lakeside Drive



Station 43 is located in the community of Grand Lake in the Halifax Regional Municipality off of Lakeside Drive. Figure 1 shows the current 2.5km, 5km and 8km response coverage area for Station 43. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is currently staffed by only two volunteers. The apparatus at the station consists of a Tanker and a Rescue vehicle.



Building and Tarmac

The station building is wood framed with vinyl siding and a wood roof with pitched shingles. The station is two stories and approximately 4,000 square feet. The building has two single deep apparatus bays. The tarmac outside the station is an asphalt covered area which extends from the bay door to the street and covers approximately 3,000 square feet. Adjacent to the tarmac is a gravel parking lot. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

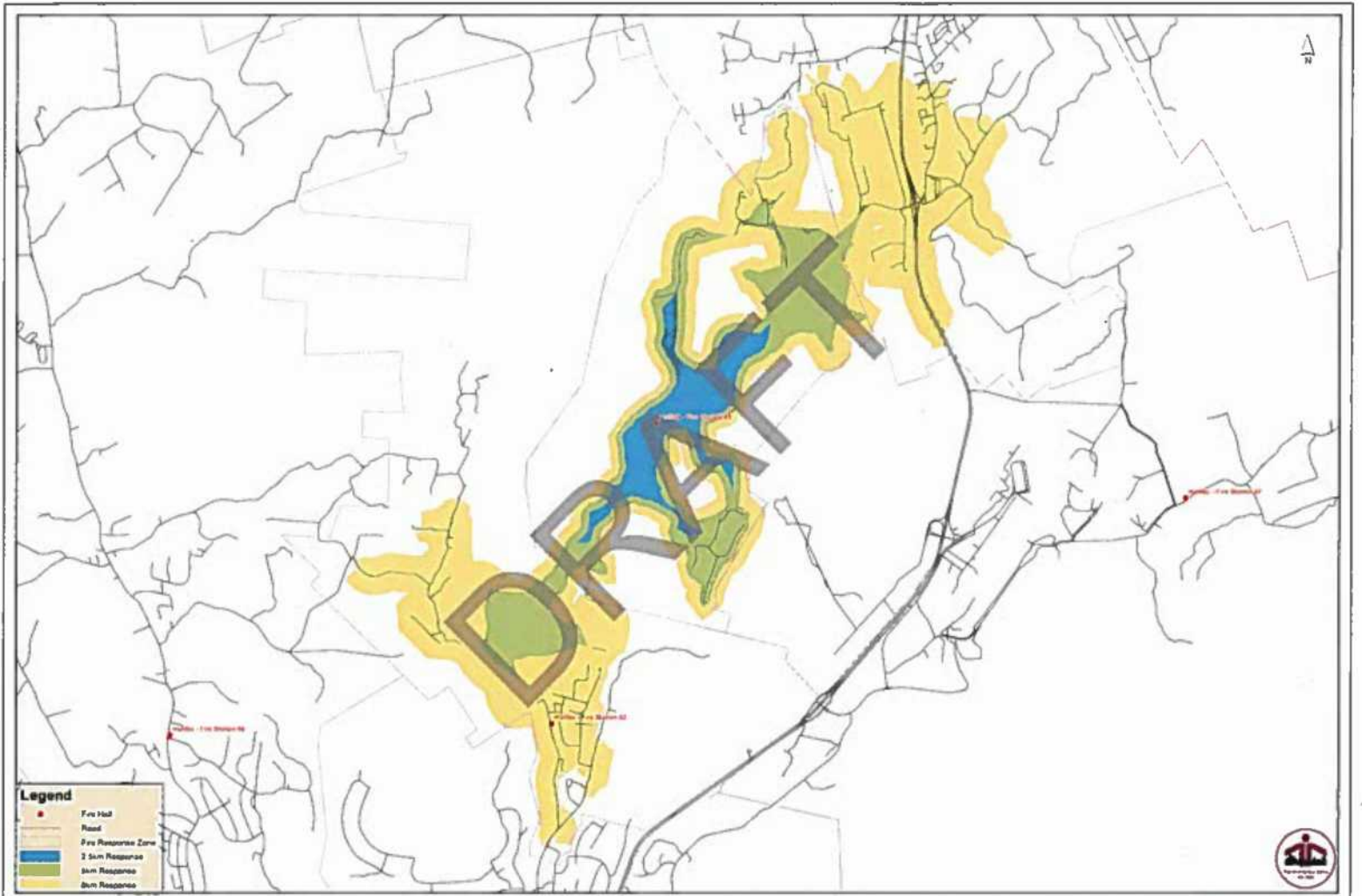
Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. Overall the facilities in this station were found to be in poor condition. The station facilities are not adequate to meet the needs of the staff.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.





Legend

- Fire Hall
- Road
- Fire Response Zone
- 2.5km Response
- 5km Response
- 8km Response

Figure 1 - 2.5/5/8km Response from Fire Station 43

Scale = 1:18,000

Regional Municipality of Halifax



Community Risk Profile – Response Zone 43

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community’s fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 537 Required Fire Flows were calculated for Response Zone 43 as shown in Figure 2 below. The Basic Fire Flows assigned for Station 43 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 90th or 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for this zone is based on the 90th Percentile Required Fire Flow value which is 1,200 IGPM.

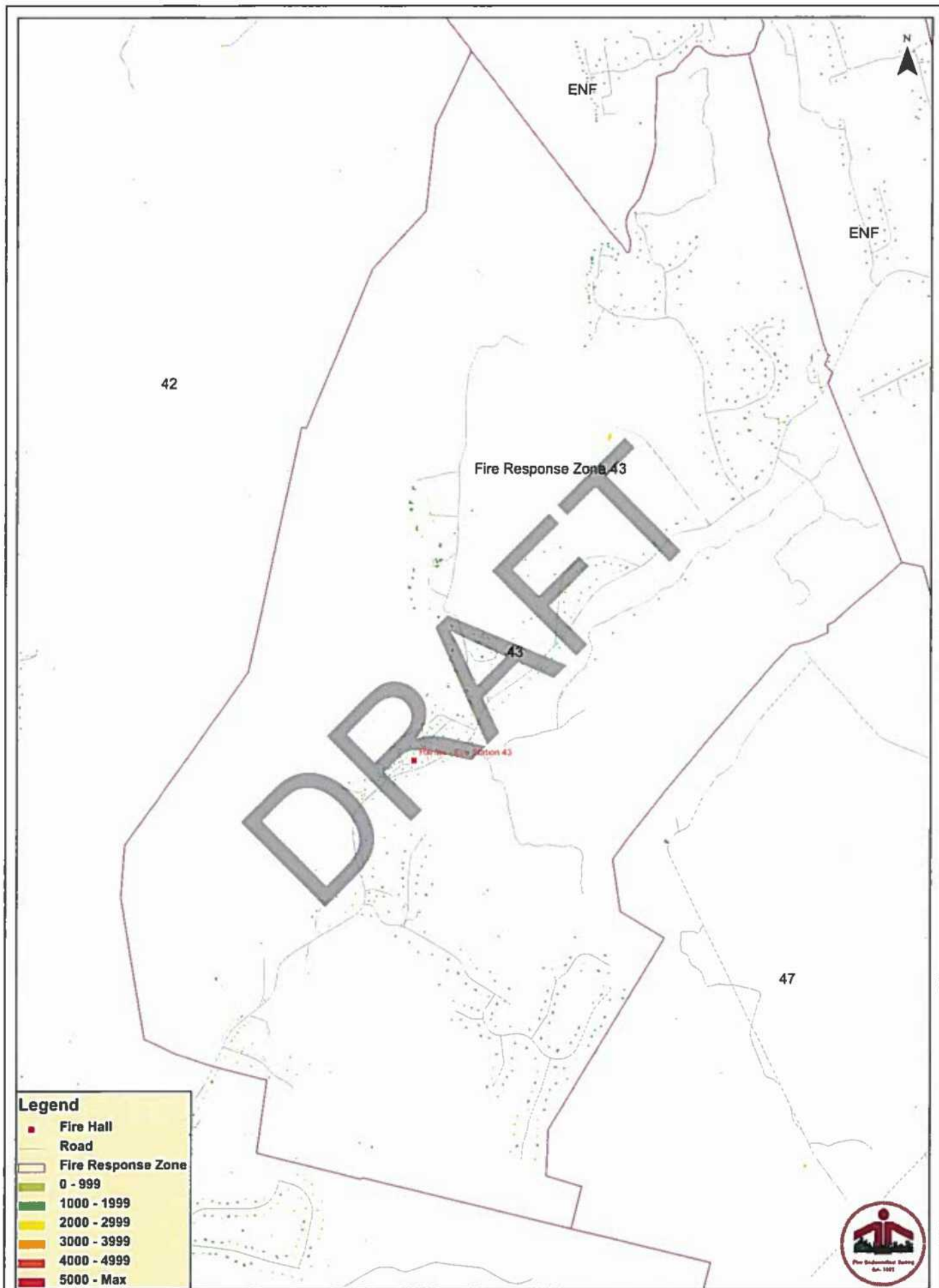
Table 1 Required Fire Flow ranges in Response Zone 43

RFF Range	No. of RFF points
0-999 IGPM	92
1000-1999 IGPM	444
2000-2999 IGPM	1
3000-3999 IGPM	0
4000-4999 IGPM	0
>=5000 IGPM	0

Table 2 Basic Fire Flows for HRM Response Zone 43

Total RFF Points	537	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,400	106.12
Max	2,000	151.60
5th highest	1,700	128.86





42

ENF

ENF

Fire Response Zone 43

43

Fire Hall - Fire Station 43

47

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Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 43 is one Engine apparatus. Station 43 is equipped with one Tanker. Standard staffing for Station 43 is 2 volunteers, which is well below the minimum of 15 volunteers or four full-time staff required on a fire department roster to provide adequate response and be recognized for fire insurance grading purposes.

Fire Calls

In the period from January 2010 until September 2013 Station 43 had 100 emergency calls with the following breakdown as shown in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or those for which the type could not be identified.

The majority of calls to Station 43 were Medical emergencies at 39 percent of the total call volume.

Table 3 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year Average	Percentage (%)
Fire	19	5	19.00
False alarm	6	2	6.00
Smoke	5	1	5.00
Motor Vehicle Accident	16	4	16.00
Oil or Gas spill	0	0	0.00
Other	5	1	5.00
Rescue	1	0	1.00
Medical Assist	39	4	39.00
Coding	9	1	9.00



Figure 3 Emergency Calls by Incident Type (2010-2013)

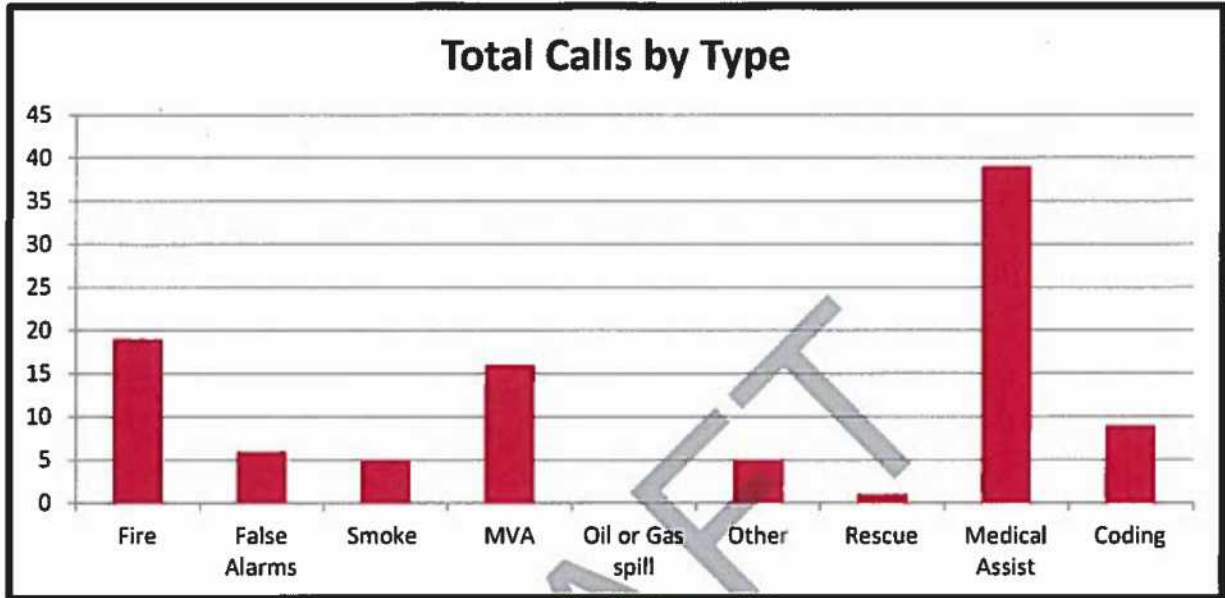


Figure 4 Percentage of Calls by Incident Type (2010-2013)

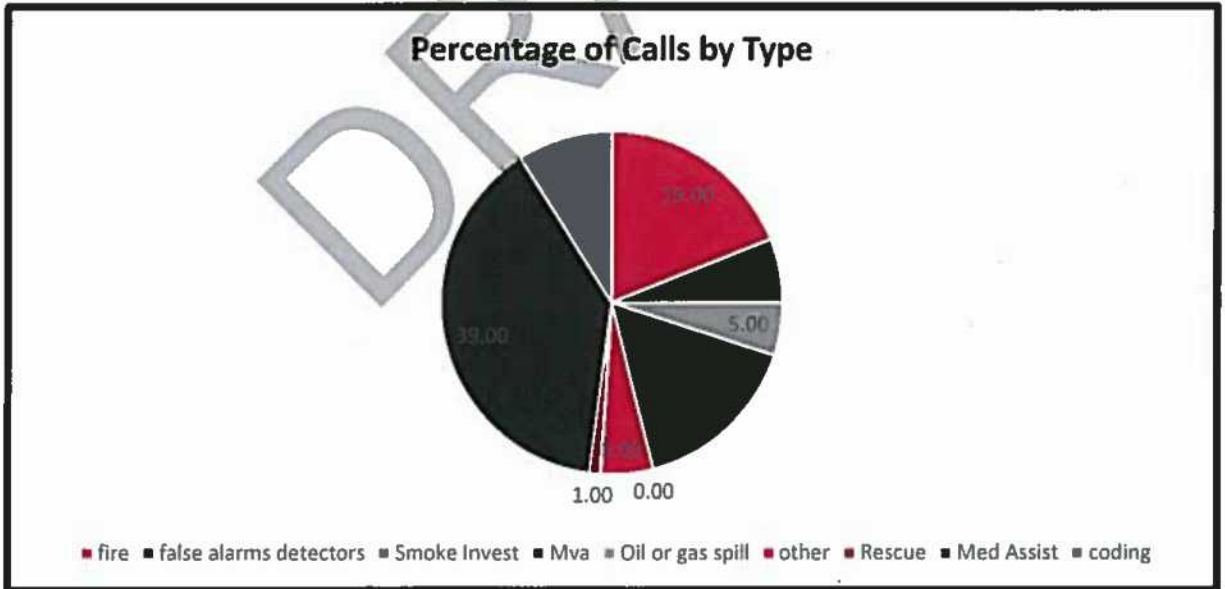


Table 4 is a breakdown of the fire calls by time of day for Station 43. The bulk of the calls are daytime and evening responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	00:00 – 06:59	13	13.0%
Daytime	07:00 – 16:59	40	40.0%
Evening	17:00 – 23:59	47	47.0%

DRAFT



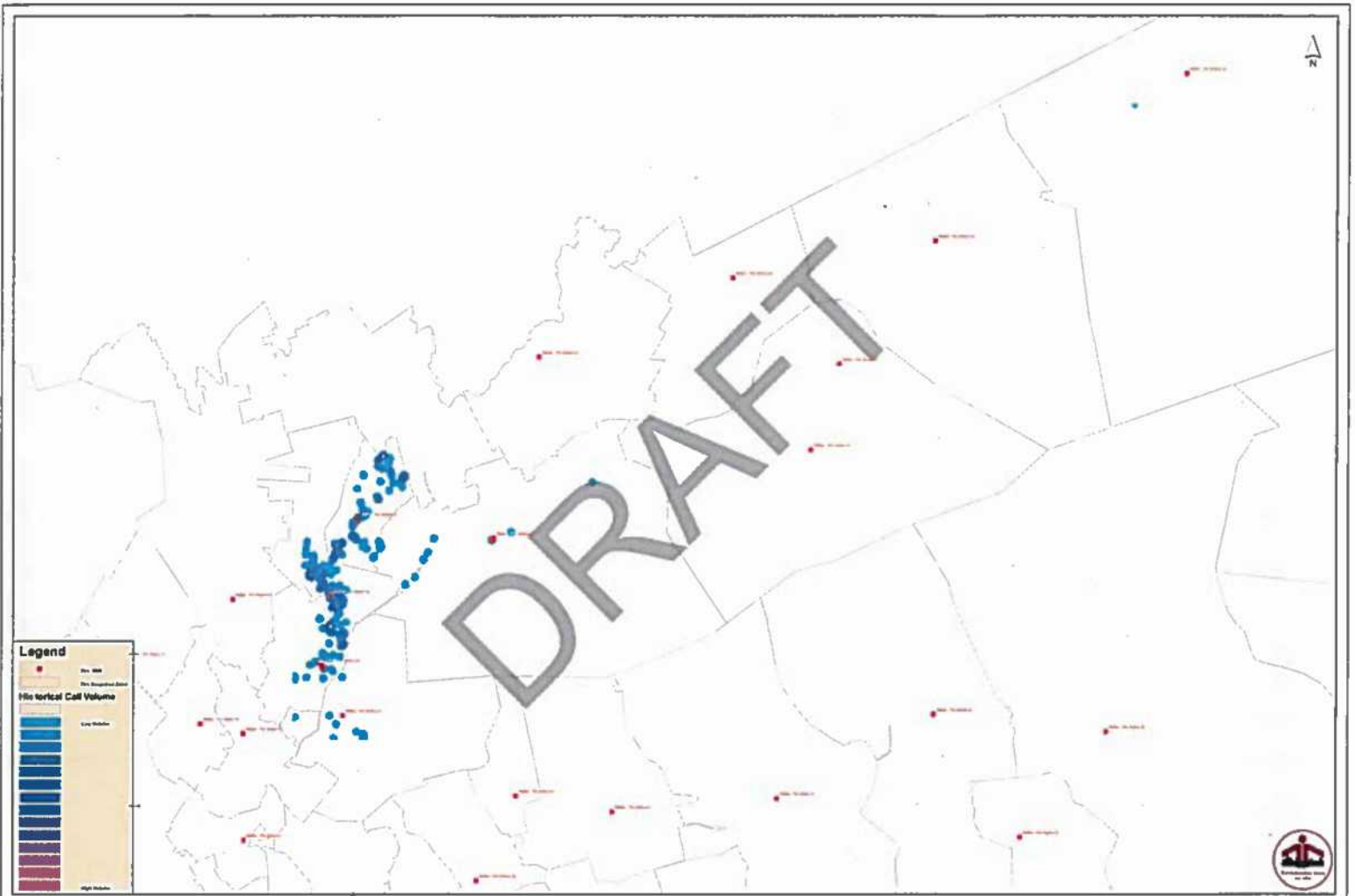


Figure 5 Historical Call Map - Fire Station 43

Scale = 1:70,000

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 43 was assigned a Public Fire Protection Classification of 1D and Dwelling Protection Grade 5.

Recommendations

- Close Station 43. The station facilities are not adequate to meet the needs of the staff and the building condition is not up to applicable codes and standards. The number of volunteer firefighters at Station 43 is well below the minimum staffing requirements of 15 volunteer fire fighters for response to the risks in this area and for fire insurance grading purposes. Due to staffing and apparatus deficiencies, the station response is not recognized for fire insurance grading. Operating this station presents an undue cost with no corresponding insurance savings as the station response is not recognized for fire insurance grading purposes.



STATION 45
1359 Fall River Road



Station 45 is located in the suburban community of Fall River in the Halifax Regional Municipality. Station 45 provides response to communities in Fall River and is located in a fairly central position for response. Figure 1 shows the current 2.5km, 5km and 8km response coverage area for Station 45. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is currently staffed by 22 volunteers and an E-Platoon to cover daytime response. Station 45 houses one Engine, a Tanker, a Rescue unit, a Tactical Support unit, Rescue boat and a Tow Vehicle.



Building and Tarmac

The station is constructed of concrete block with brick veneer and the roof construction is of aluminum flat truss. The building was constructed in 2008 and has two stories at approximately 8,600 square feet. The tarmac outside the station is a partly concrete and partly asphalt covered area which extends from the bay door to the street and covers a public parking area. The paved area covers approximately 5,800 square feet. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

The station is fully sprinklered and is equipped with a fire alarm system with heat and smoke detectors.

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. Overall the facilities in this station were found to be in good condition.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.





Figure 1 - 2.55/km Response from Fire Station 45

Scale = 1:10,000

Community Risk Profile – Response Zone 45

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community’s fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 2,689 Required Fire Flows were calculated for Response Zone 45 as shown in Figure 2 below. The Basic Fire Flows assigned for Station 45 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for this zone is based on the 95th Percentile Required Fire Flow value which is 1,400 IGPM.

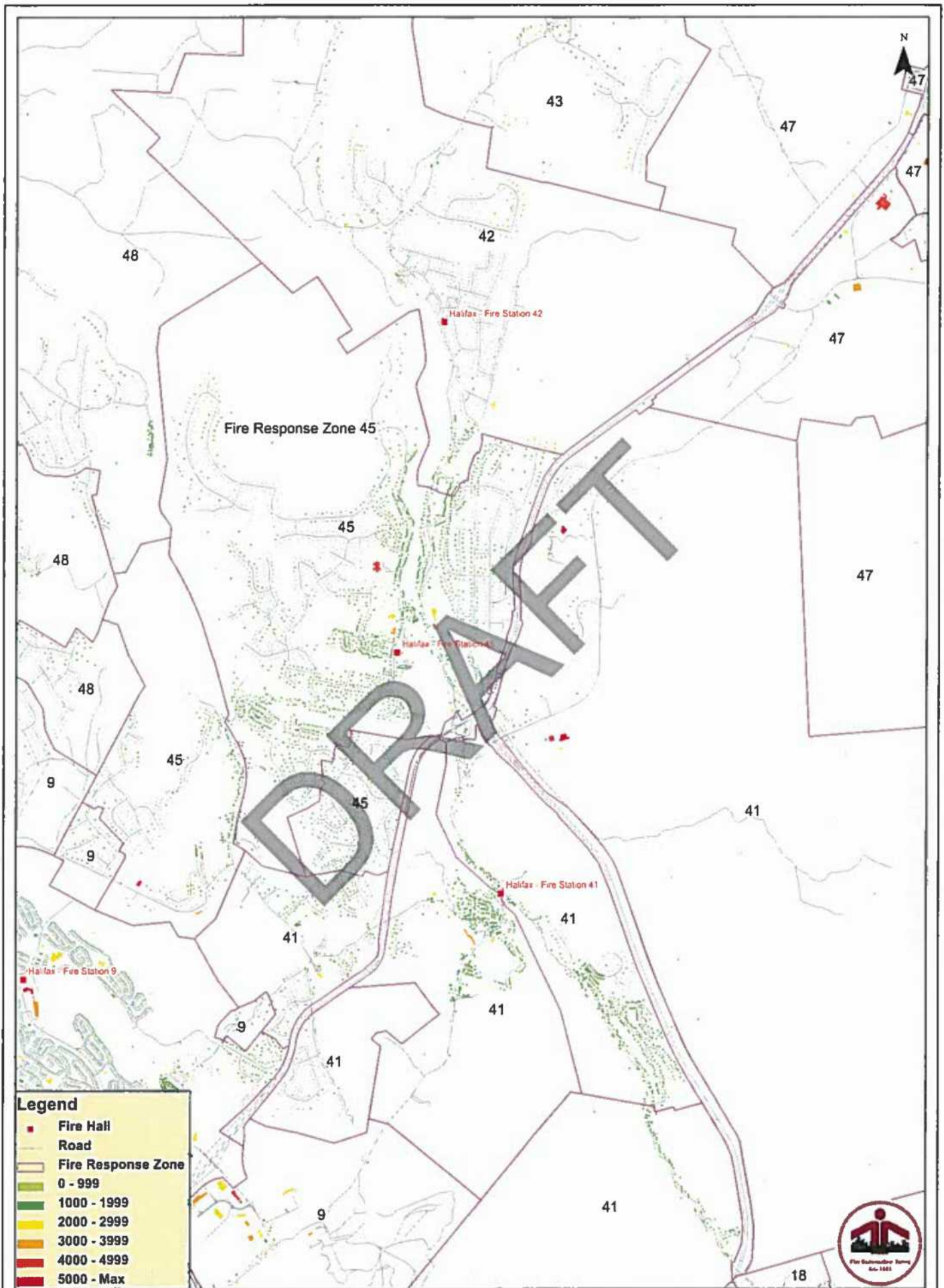
Table 1 Required Fire Flow ranges in Response Zone 45

RFF Range	No. of RFF points
0-999 IGPM	109
1000-1999 IGPM	2,566
2000-2999 IGPM	9
3000-3999 IGPM	3
4000-4999 IGPM	2
>=5000 IGPM	0

Table 2 Basic Fire Flows for HRM Response Zone 45

Total RFF Points	2,689	
	IGPM	L/s
90th Percentile	1,400	106.12
95th Percentile	1,400	106.12
Max	4,400	333.52
5th highest	3,400	257.72





Apparatus and Personnel

Based on the Basic Fire Flow of 1,400 IGPM, the benchmark number of apparatus required for Fire Station 45 is one Engine apparatus. Station 45 is equipped with one Engine. Standard staffing for Station 45 is 22 volunteers and an E-platoon which allows the station to meet the minimum initial response of four to six fire fighters available to respond on first alarms. Considering expected community growth in this response zone and corresponding changes to the community risk level, plans should be put in place for staffing Station 45 with one full-time crew of four firefighters.

Fire Calls

In the period from January 2010 until September 2013, Station 45 received 904 emergency calls with a breakdown by call type as shown in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or those for which the types of calls could not be identified.

The majority of calls to Station 45 were Medical emergencies at 39.8 percent of the total call volume.

Table 3 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year Average	Percentage (%)
Fire	85	23	9.40
False alarm	118	31	13.05
Smoke	57	15	6.30
Motor Vehicle Accident	140	37	15.49
Oil or Gas spill	2	0.5	0.22
Other	21	6	2.32
Rescue	3	1	0.33
Med Assist	360	96	39.82
Coding	118	31	13.07



Figure 3 Emergency Calls by Incident Type (2010-2013)

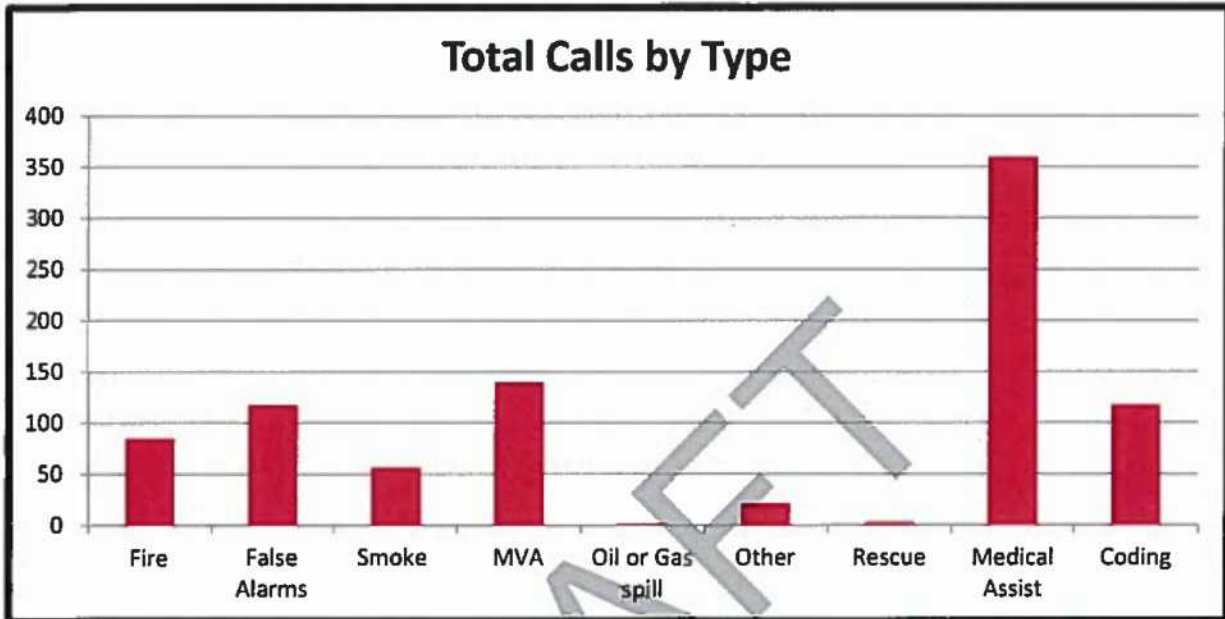


Figure 4 Percentage of Calls by Incident Type (2010-2013)

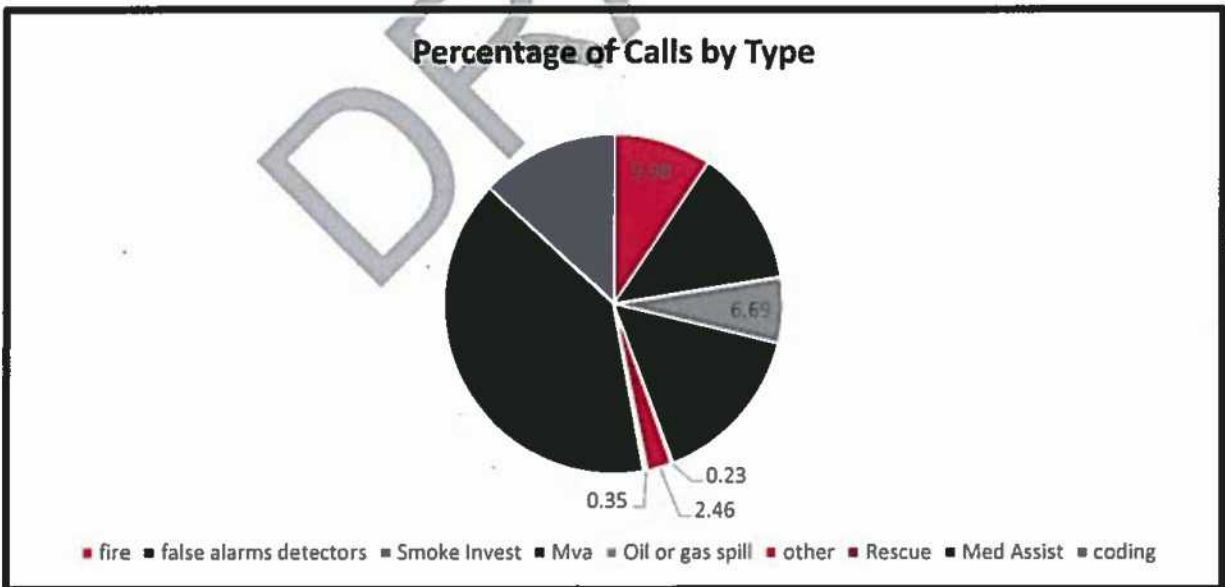


Table 4 is a breakdown of the fire calls by time of day for Station 45. The bulk of the calls are daytime and evening responses in this area.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	00:00 – 06:59	96	10.6%
Daytime	07:00 – 16:59	523	57.9%
Evening	17:00 – 23:59	285	31.5%

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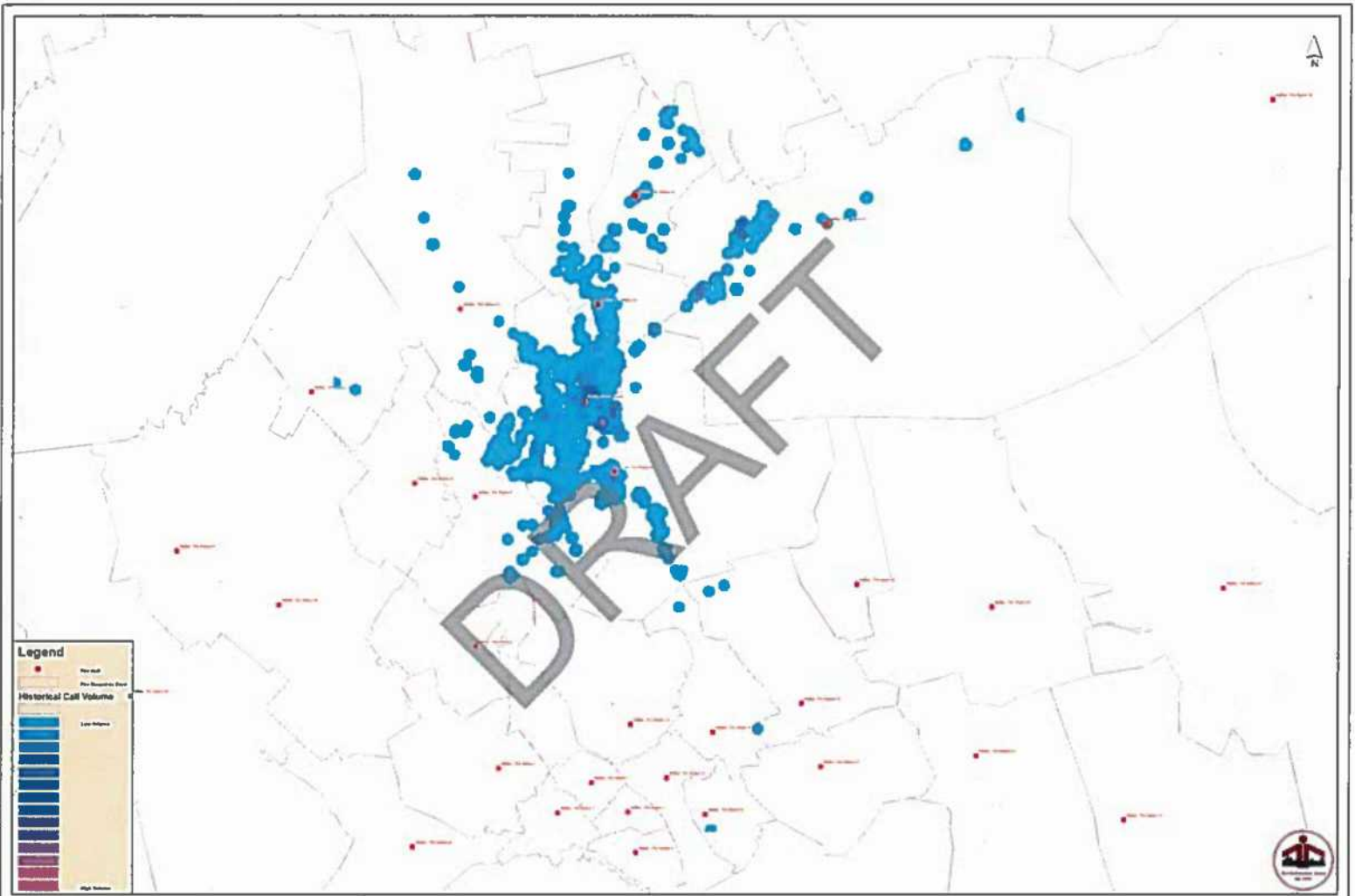


Figure 5 Historical Call Map - Fire Station 45

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 45 was assigned a Public Fire Protection Classification of 8 and Dwelling Protection Grade 3B.

Recommendations

- The station facilities are adequate to meet the needs of the staff. This station is adequate for use as a 24/7 hall in the future. Considering expected community growth, plans for career staffing at this hall should be put in place.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 47
2040 Old Guysborough Road



Station 47 is located in the rural community of Goffs in the Halifax Regional Municipality. Figure 1 shows the current 2.5 km, 5 km and 8 km response coverage area for Station 47. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area (8 km coverage) represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by 7 volunteer fire fighters and houses a Tanker and a Rescue vehicle.

Building and Tarmac

The station is a wood framed building with vinyl siding and the roof construction is of aluminum siding. The building is one story and approximately 2,500 square feet. It was originally constructed in the 1970's but a number of extensions were added in the 1990's.



The tarmac outside the station is a partly gravel and partly asphalt covered area which extends from the bay door to the street and covers a public parking area. The tarmac covers approximately 2,500 square feet. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. Overall the facilities in this Station were found to be in good condition.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

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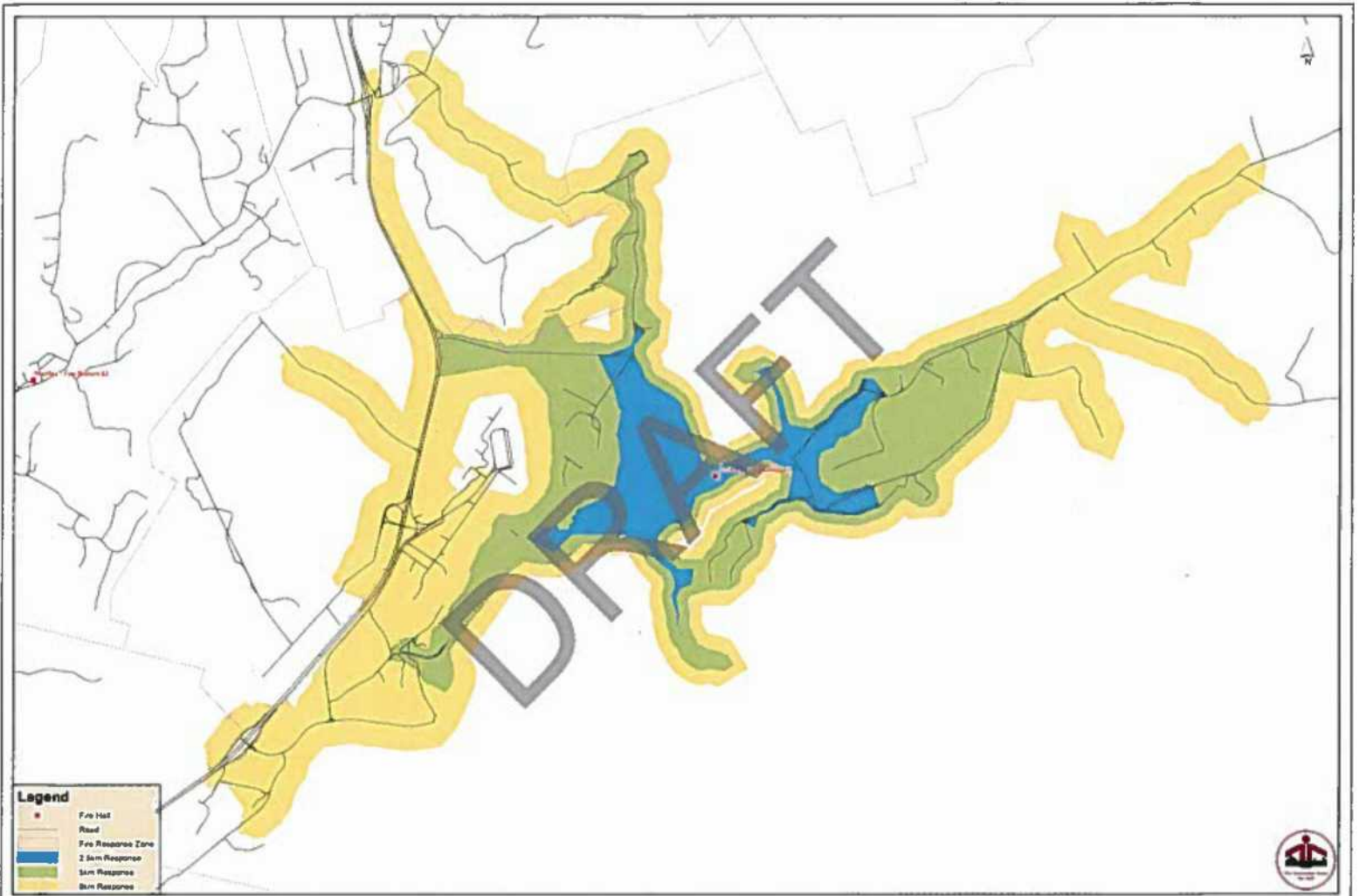


Figure 1 - 2.5km/8km Response from Fire Station 47

Regional Municipality of Halifax

Scale = 1:14,000



Community Risk Profile – Response Zone 47

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 241 Required Fire Flows were calculated for Response Zone 47 as shown in Figure 2 below. The Basic Fire Flows assigned for Station 47 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 90th or 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited to large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for this zone is based on the 90th Percentile Required Fire Flow value which is 2,200 IGPM.

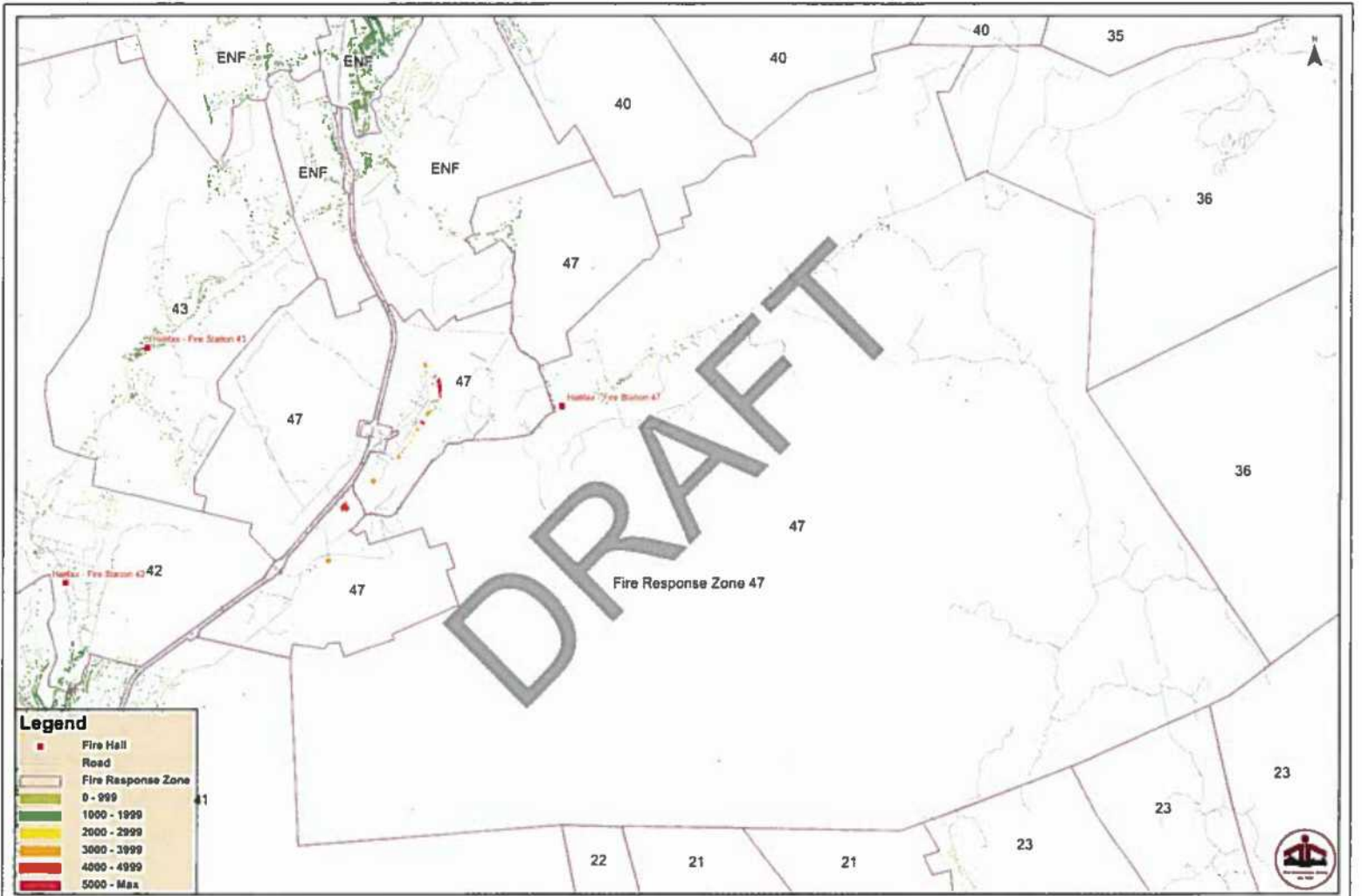
Table 1 Required Fire Flow ranges in Response Zone 47

RFF Range	No. of RFF points
0-999 IGPM	76
1,000-1,999 IGPM	135
2,000-2,999 IGPM	16
3,000-3,999 IGPM	9
4,000-4,999 IGPM	3
>=5,000 IGPM	2

Table 2 Basic Fire Flows for HRM Response Zone 47

Total RFF Points	241	
	IGPM	L/s
90th Percentile	2,200	166.76
95th Percentile	3,100	234.98
Max	7,300	553.34
5th highest	4,400	333.52





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Legend

- Fire Hall
- Road
- - - Fire Response Zone
- 0 - 999
- 1000 - 1999
- 2000 - 2999
- 3000 - 3999
- 4000 - 4999
- 5000 - Max

Apparatus and Personnel

Based on the Basic Fire Flow of 2,200 IGPM, the benchmark number of apparatus required for Fire Station 47 is three Engine apparatus. Station 47 is equipped with one Engine. Standard staffing for Station 47 is 7 volunteers, which is below the minimum of 15 volunteers or four to six full-time staff required on a fire department roster to provide adequate response and be recognized for fire insurance grading purposes.

Fire Calls

In the period from January 2010 until September 2013 Station 47 had 321 emergency calls with the following breakdown as shown in Table 3 and Figure 3 and 4 below. The year average was calculated for all calls over the 45 months reviewed.

The majority of calls responded to from this station were Medical calls at 50% of the total call volume.

Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls that could not be identified.

Table 3 Emergency calls by Incident Type

Call by Type			
Type	Total	Year Average	Percentage (%)
Fire	21	6	6.54
False alarm	81	22	25.23
Smoke	21	6	6.54
Motor Vehicle Accident	94	25	29.28
Oil or Gas spill	5	1.7	1.56
Other	13	3	4.05
Rescue	0	0	0.00
Medical Assist	37	10	11.53
Coding	49	13	15.27



Figure 3 Emergency Calls by Incident Type (2010-2013)

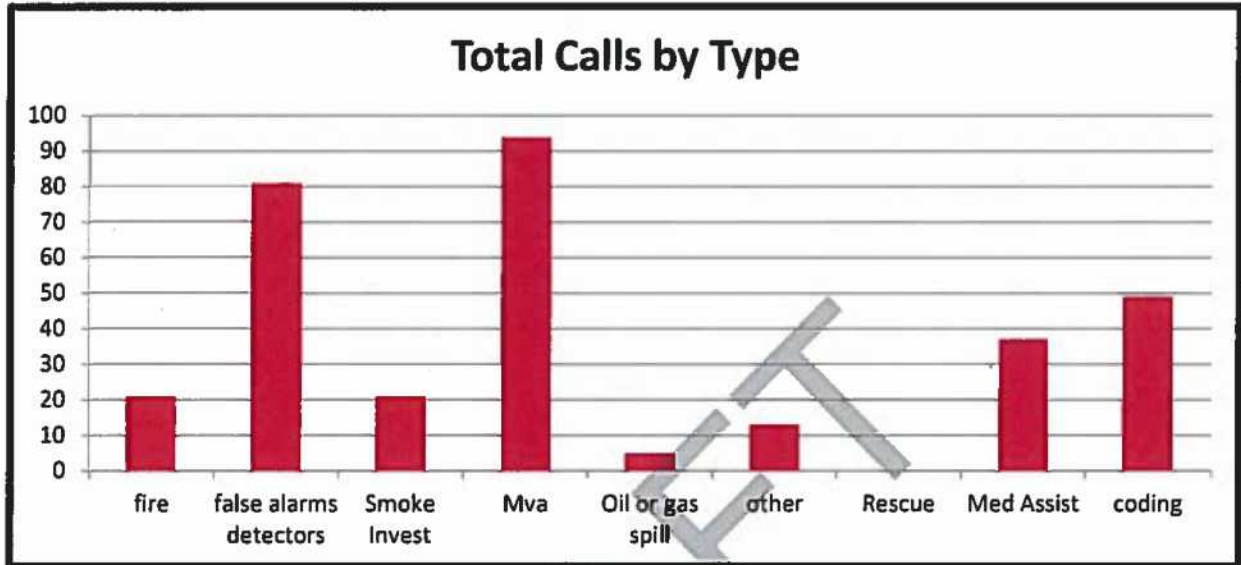


Figure 4 Percentage of Calls by Incident Type (2010-2013)

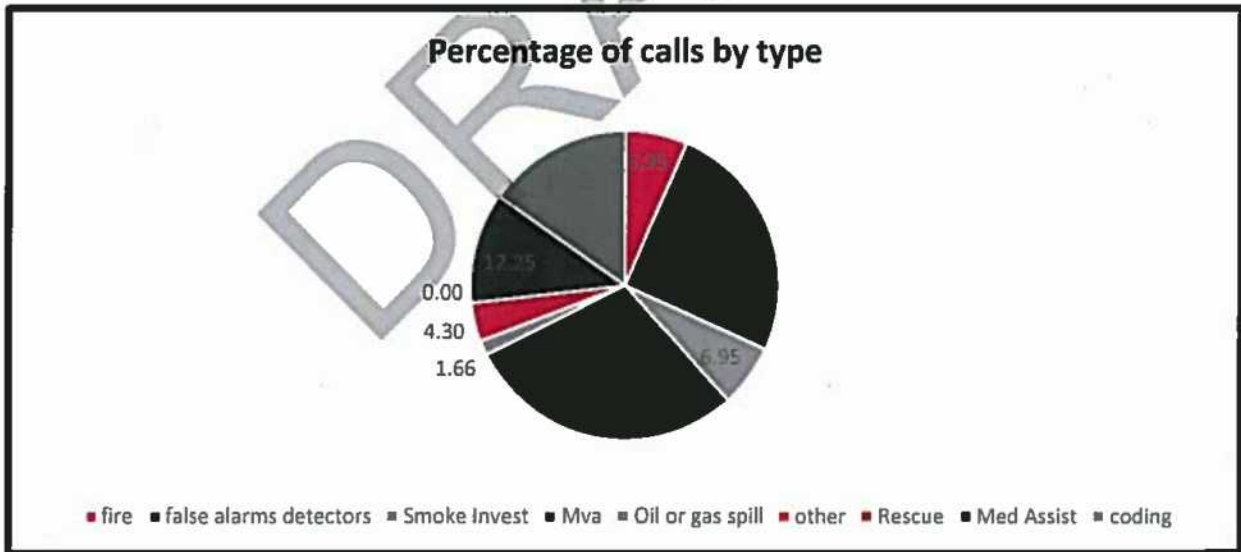


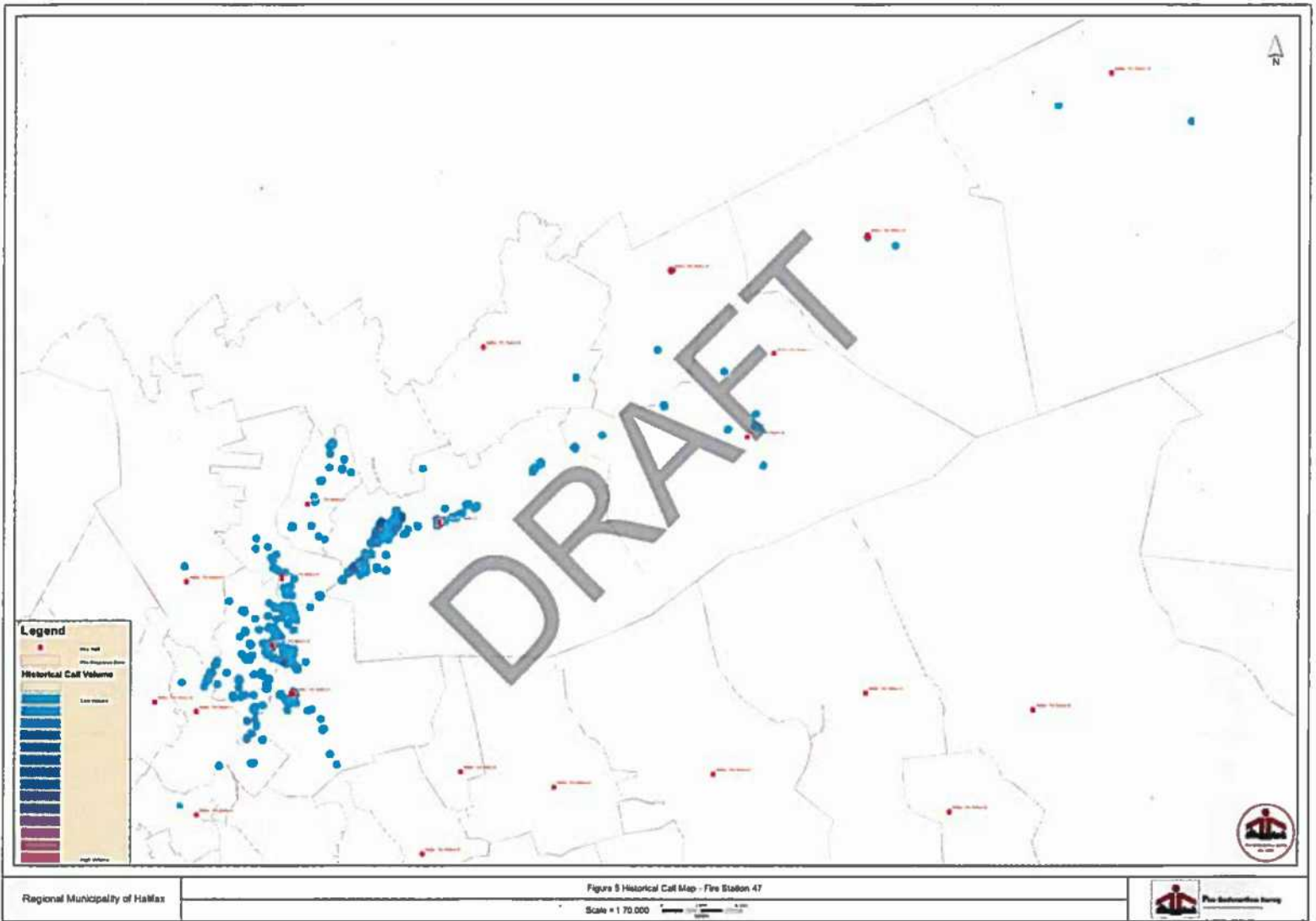
Table 4 is a breakdown of the fire calls by time of day for Station 47. The bulk of the calls are daytime and evening responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	50	15.6%
Daytime	0700 – 1659	185	57.6%
Evening	1700 – 2359	86	26.8%

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Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 47 was assigned a Public Fire Protection Classification of 10 and Dwelling Protection Grade 5.

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.



STATION 48

1581 Beaver Bank Road



Station 48 is located in the community of Beaver Bank off of Beaver Bank road. Station 48 is located in a fairly central position for response. Figure 1 shows the current 2.5km, 5km and 8km response coverage area for Station 48. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is currently staffed by 25 volunteers and houses one Engine, a Tanker and a Rescue unit.



Building and Tarmac

The station is constructed of concrete block with a brick exterior siding. The roof construction is aluminum with asphalt shingle covering. The two story station is approximately 16,700 square feet. It is fully sprinklered and is equipped with a fire alarm system with heat and smoke detectors. There are fire alarm pull stations by each exit.

The tarmac outside the station is an asphalt covered area which extends from the bay door to the street and covers approximately 5,400 square feet. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

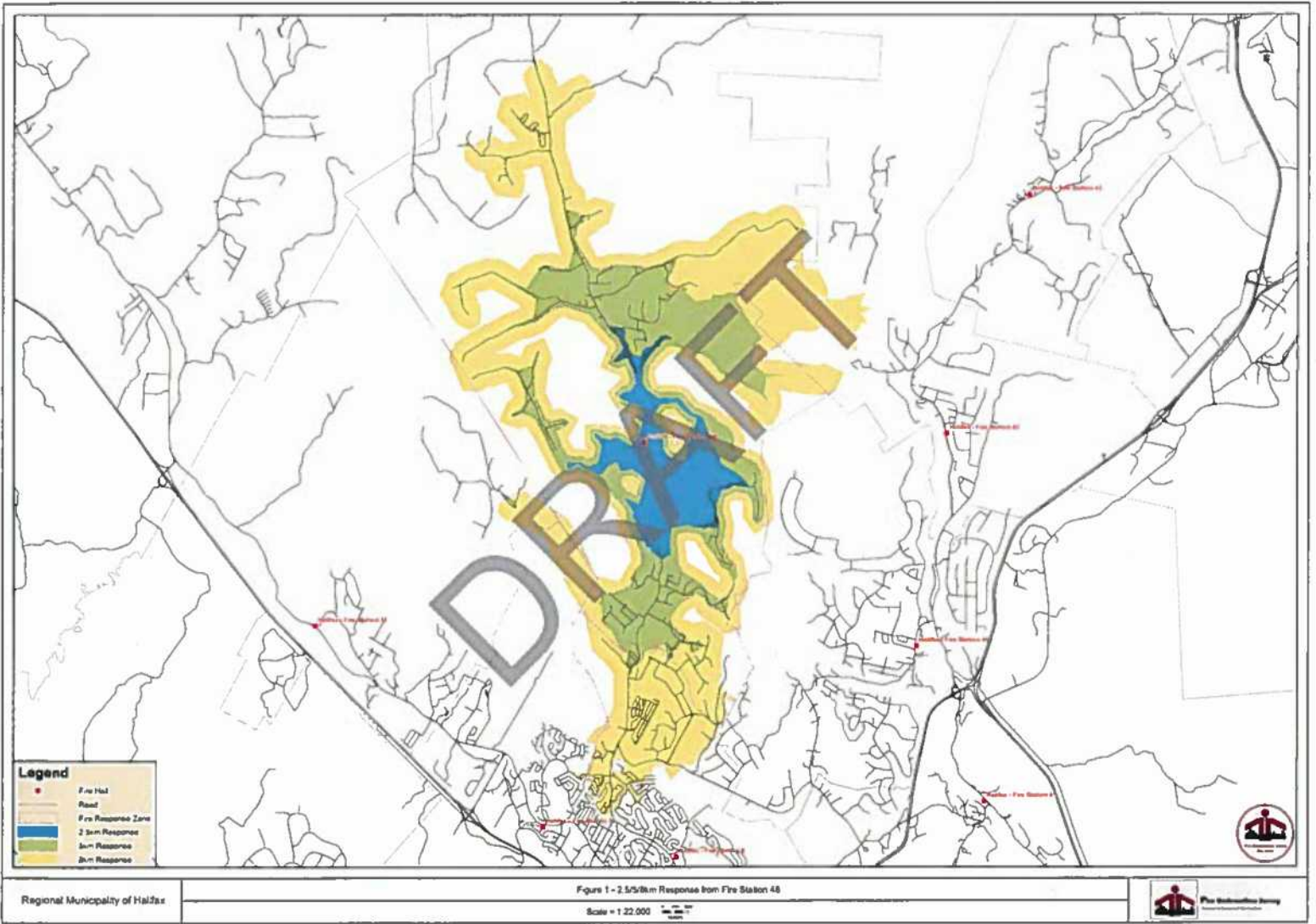
Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. Overall the facilities in this station were found to be in good condition.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.





Community Risk Profile – Response Zone 48

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 2,196 Required Fire Flows were calculated for Response Zone 48 as shown in Figure 2. The Basic Fire Flows assigned for Station 48 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for this zone is based on the 95th Percentile Required Fire Flow value which is 1,200 IGPM.

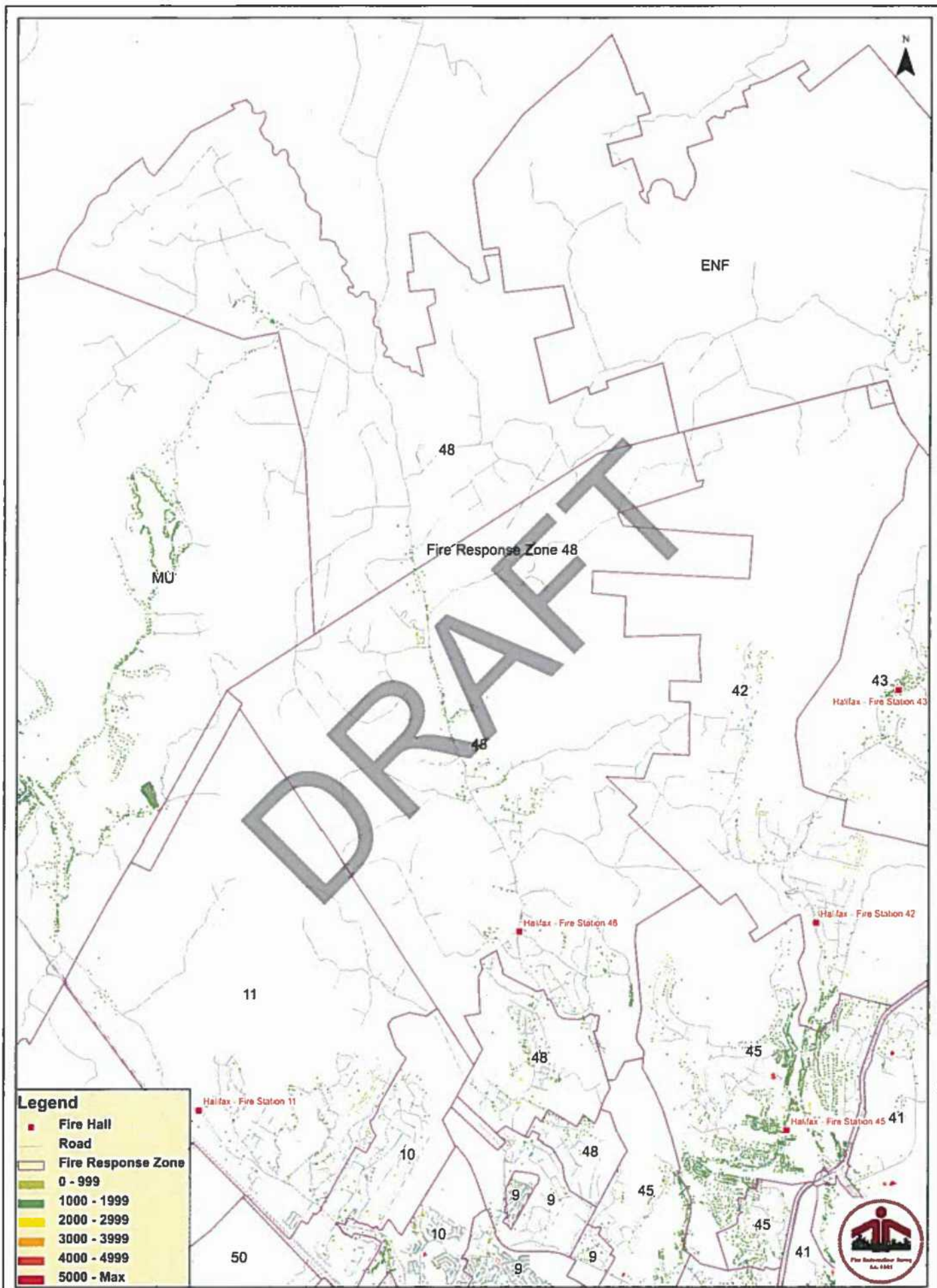
Table 1 Required Fire Flow ranges in Response Zone 48

RFF Range	No. of RFF points
0-999 IGPM	736
1000-1999 IGPM	1,454
2000-2999 IGPM	5
3000-3999 IGPM	1
4000-4999 IGPM	0
>=5000 IGPM	0

Table 2 Basic Fire Flows for HRM Response Zone 48

Total RFF Points	2,196	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,200	90.96
Max	3,400	257.72
5th highest	2,400	181.92





Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 48 is one Engine apparatus. Station 48 is equipped with one Engine, a Tanker and a Rescue unit. Standard staffing for Station 48 is 25 volunteers, which allows the station to meet the minimum initial response of four to six fire fighters available to respond on first alarms.

Fire Calls

In the period from January 2010 until September 2013 Station 48 had 499 emergency calls with the following breakdown as shown in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or those for which the types of calls could not be identified. The year average was calculated for all calls over the 45 months reviewed.

The majority of calls to Station 48 were Medical emergencies at 56.5 percent of the total call volume.

Table 3 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year Average	Percentage (%)
Fire	47	13	9.42
False alarm	61	16	12.22
Smoke	21	6	4.21
Motor Vehicle Accident	36	10	7.21
Oil or Gas spill	1	0.3	0.20
Other	7	2	1.40
Rescue	0	0	0.00
Medical Assist	282	75	56.51
Coding	44	12	8.83



Figure 3 Emergency Calls by Incident Type (2010-2013)

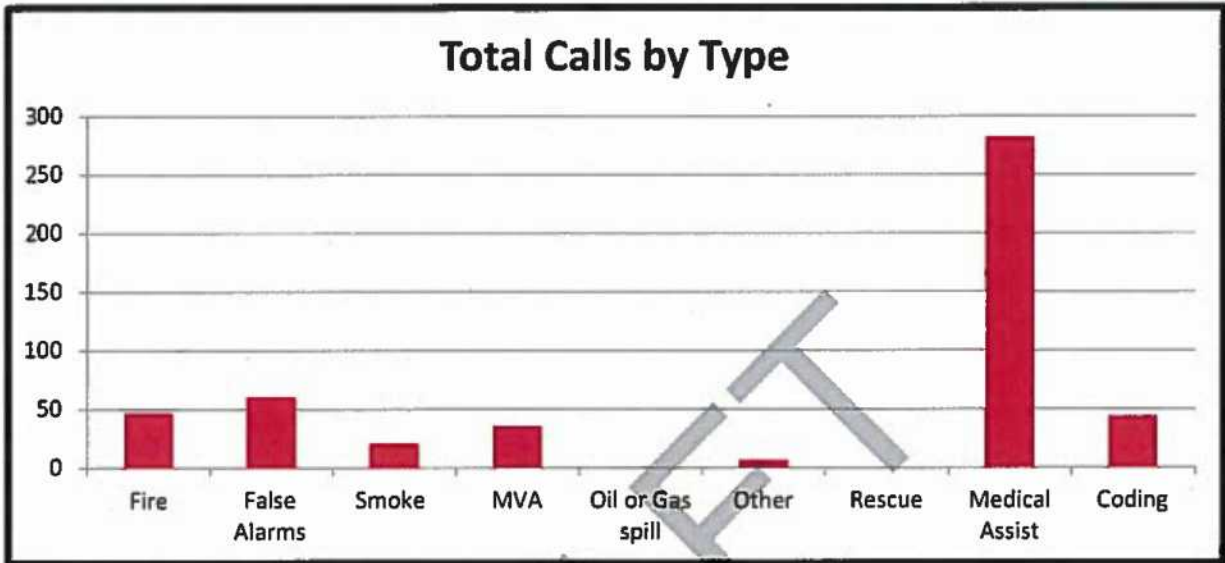


Figure 4 Percentage of Calls by Incident Type (2010-2013)

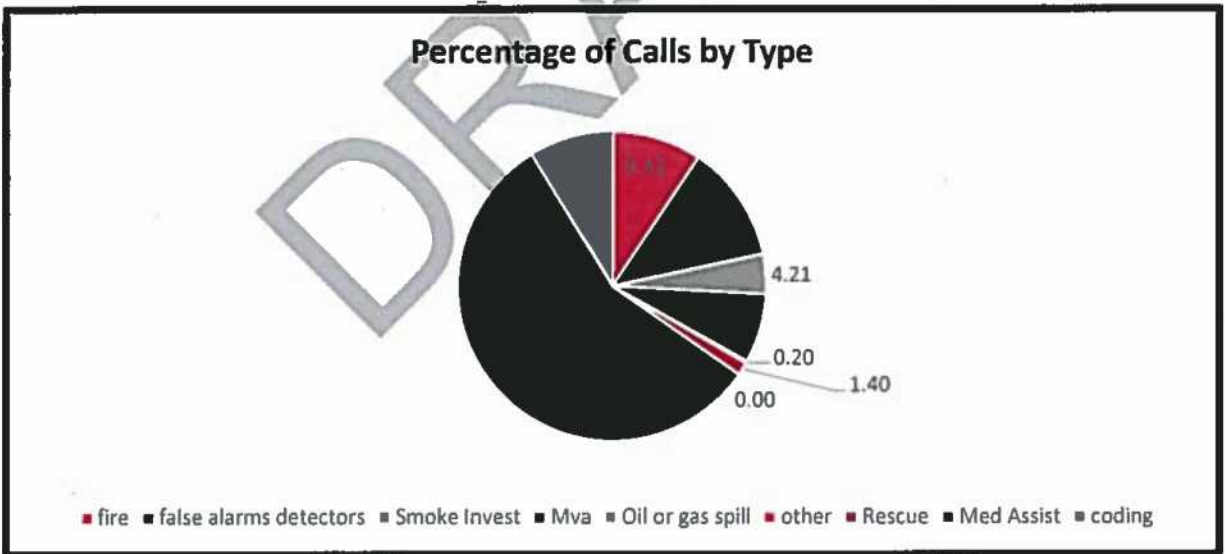


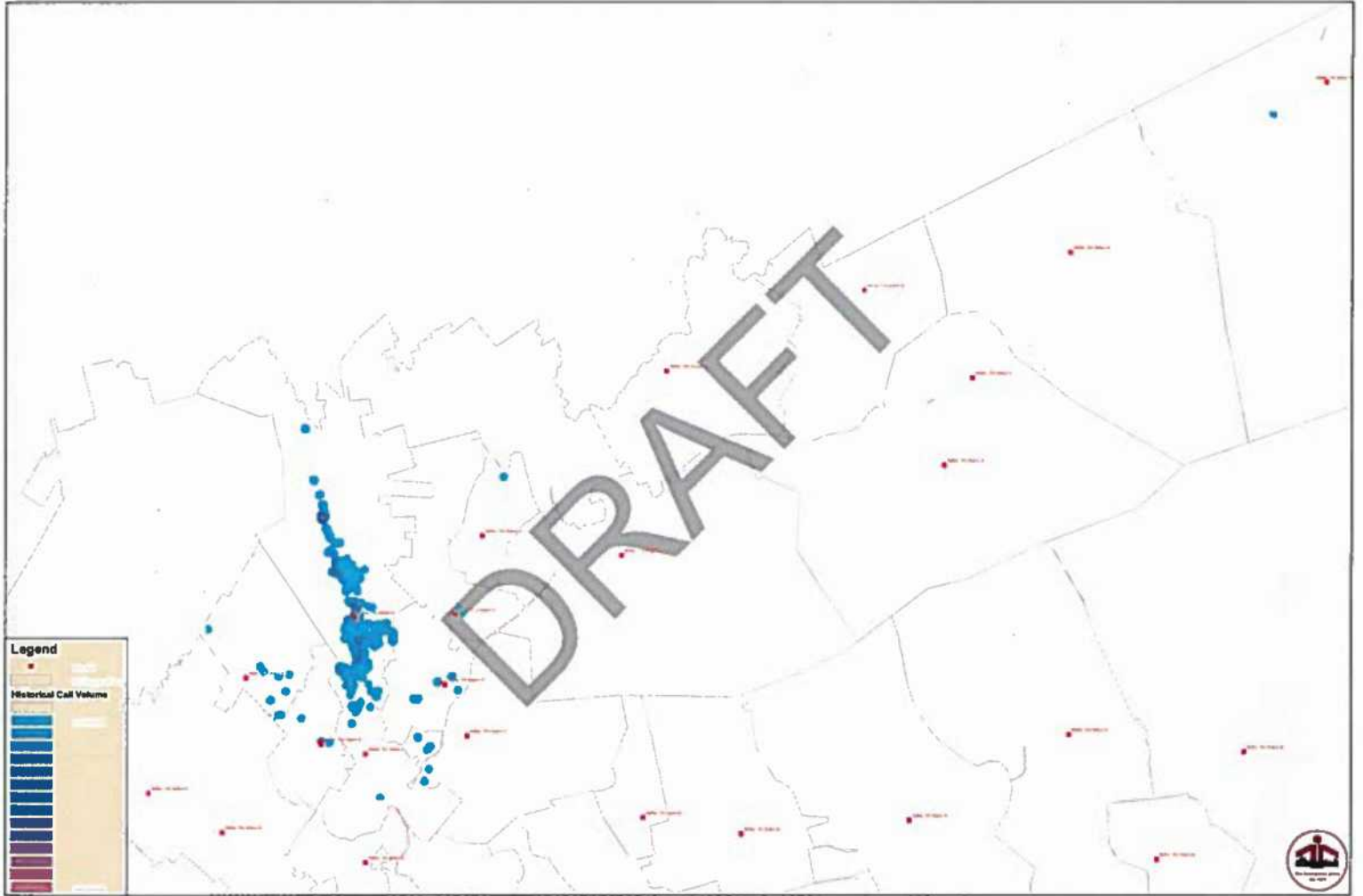
Table 4 is a breakdown of the fire calls by time of day for Station 48. The bulk of the calls are daytime and evening responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	00:00 – 06:59	67	13.4%
Daytime	07:00 – 16:59	226	45.3%
Evening	17:00 – 23:59	206	41.3%

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Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 48 was assigned a Public Fire Protection Classification of 8 and Dwelling Protection Grade 3B.

Recommendations

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



STATION 50
250 Hammonds Plains Road



Station 50 is located in the community of Hammonds Plains off of Hammonds Plains Road. Station 50 is located in a fairly central position for response. Figure 1 shows the current 2.5km, 5km and 8km response coverage area for Station 50. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is currently staffed by 18 volunteers and houses one Engine, a Tanker and a Rescue unit.



Building and Tarmac

The station is constructed of concrete block with an aluminum exterior siding. The roof construction is aluminum. The two story station is approximately 11,200 square feet. The tarmac outside the station is an asphalt covered area which extends from the bay door to the street and covers approximately 8,300 square feet. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. Overall the facilities in this station were found to be in good condition.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

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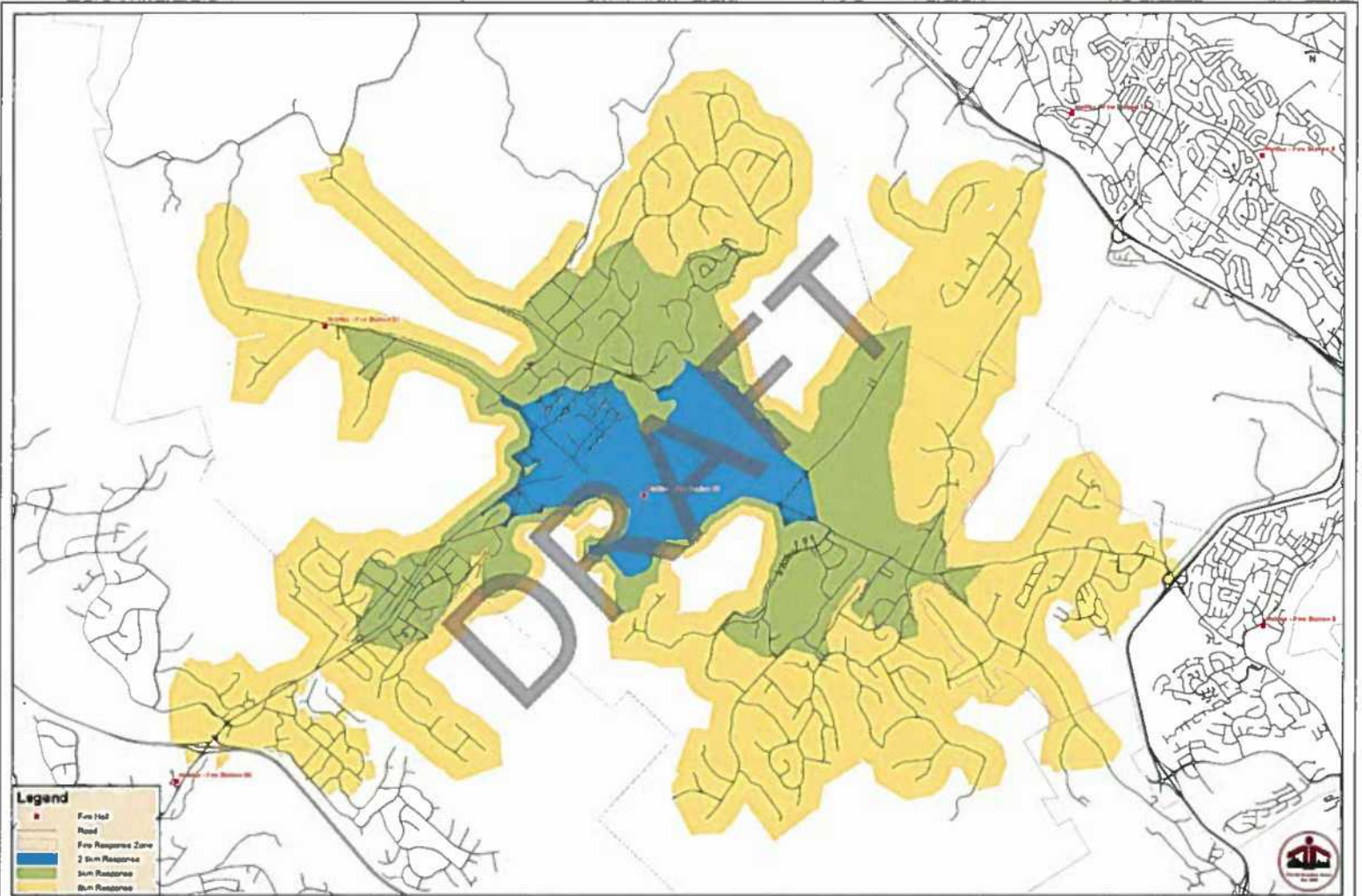


Figure 1 - 2.55/5km Responses from Fire Station 50

Scale = 1:16,000

Community Risk Profile – Response Zone 50

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 4,152 Required Fire Flows were calculated for Response Zone 50 as shown in Figure 2. The Basic Fire Flows assigned for Station 50 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for this zone is based on the 5th Highest Required Fire Flow value which is 2,400 IGPM.

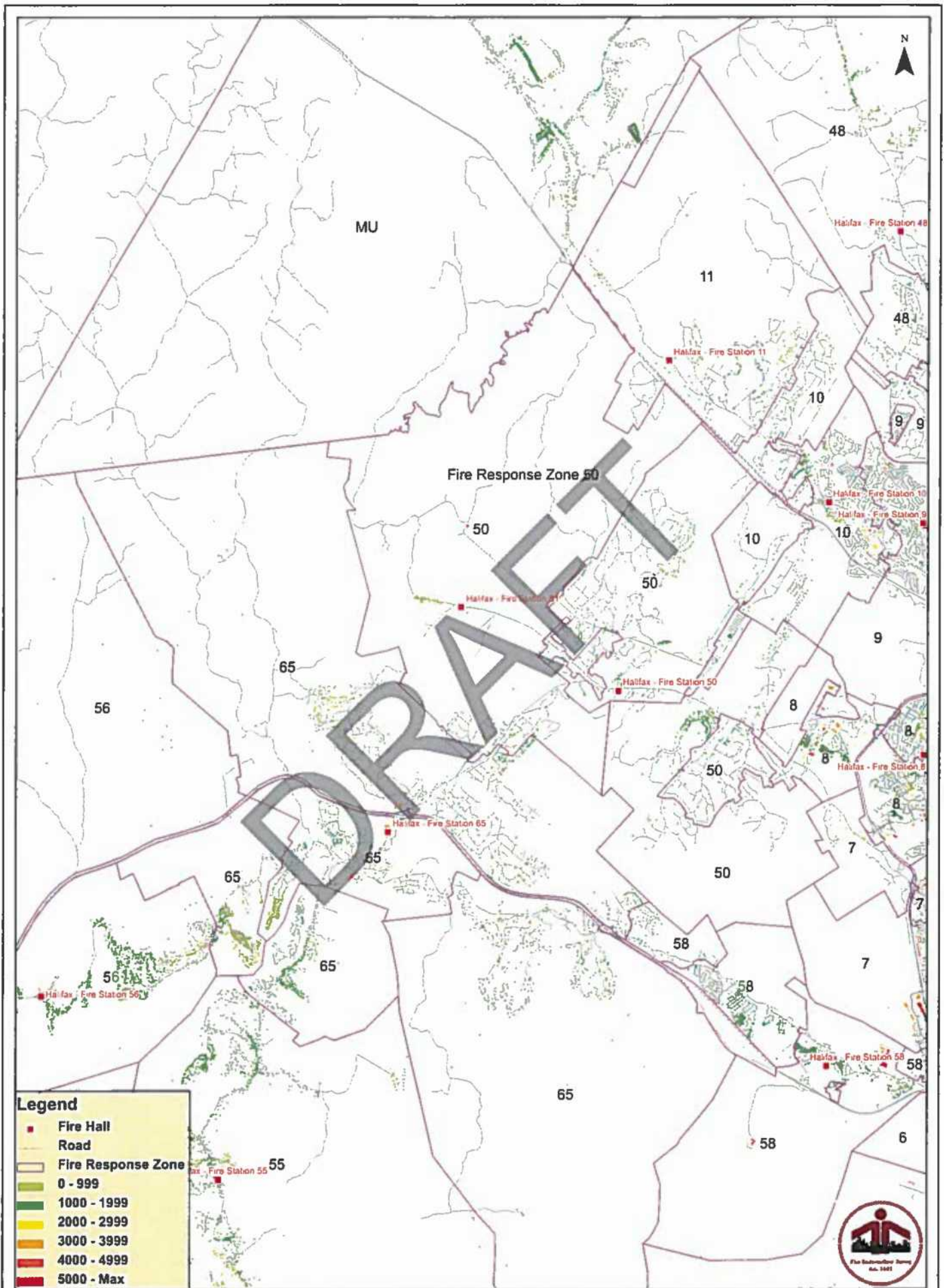
Table 1 Required Fire Flow ranges in Response Zone 50

RFF Range	No. of RFF points
0-999 IGPM	1,204
1000-1999 IGPM	2,936
2000-2999 IGPM	10
3000-3999 IGPM	1
4000-4999 IGPM	1
>=5000 IGPM	0

Table 2 Basic Fire Flows for HRM Response Zone 50

Total RFF Points	4,152	
	IGPM	L/s
90th Percentile	1,400	106.12
95th Percentile	1,400	106.12
Max	4,100	310.78
5th highest	2,400	181.92





- Legend**
- Fire Hall
 - Road
 - ▭ Fire Response Zone
 - 0 - 999
 - 1000 - 1999
 - 2000 - 2999
 - 3000 - 3999
 - 4000 - 4999
 - 5000 - Max

Figure 2 Halifax Fire Response Zone 50 - Building Footprints with RFF Value

Apparatus and Personnel

Based on the Basic Fire Flow of 2,400 IGPM, the benchmark number of apparatus required for Fire Station 50 is two Engine apparatus. Station 50 is equipped with one Engine. Standard staffing for Station 50 is 18 volunteers, which allows the station to meet the minimum initial response of four to six fire fighters available to respond on first alarms.

Fire Calls

In the period from January 2010 until September 2013, Station 50 received 873 emergency calls with the following breakdown as shown in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or those for which the type of call could not be identified.

The majority of calls to Station 50 were Medical emergencies at 45 percent of the total call volume.

Table 3 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year Average	Percentage (%)
Fire	124	33	14.20
False alarm	125	33	14.32
Smoke	40	11	4.58
Motor Vehicle Accident	80	21	9.16
Oil or Gas spill	2	0.5	0.23
Other	20	5	2.29
Rescue	2	0.5	0.23
Med Assist	391	104	44.79
Coding	89	24	10.20



Figure 3 Emergency Calls by Incident Type (2010-2013)

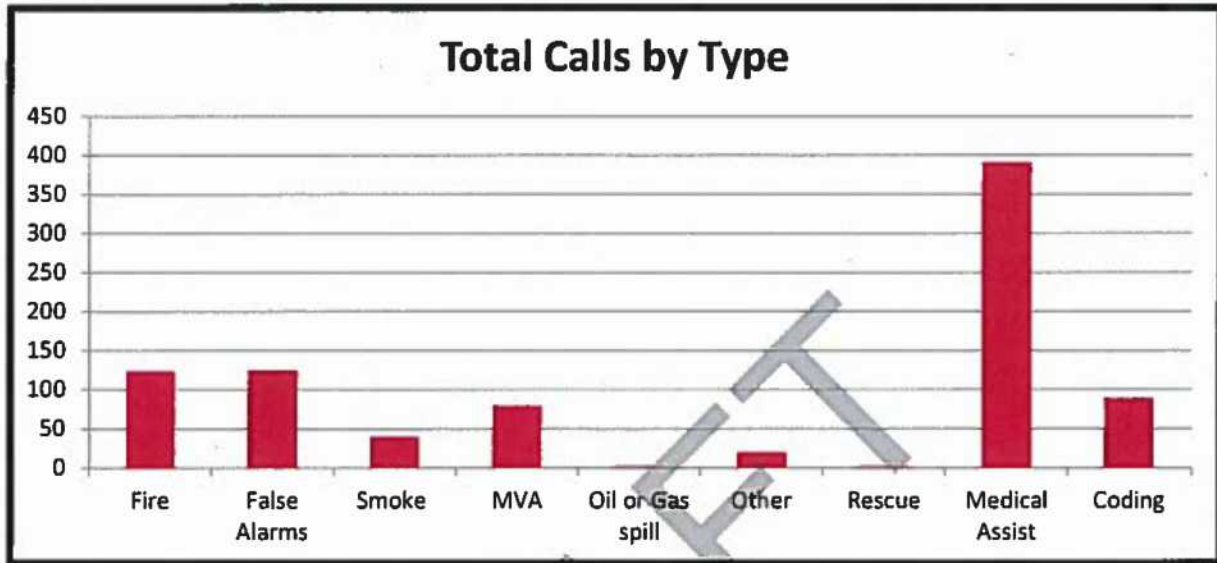


Figure 4 Percentage of Calls by Incident Type (2010-2013)

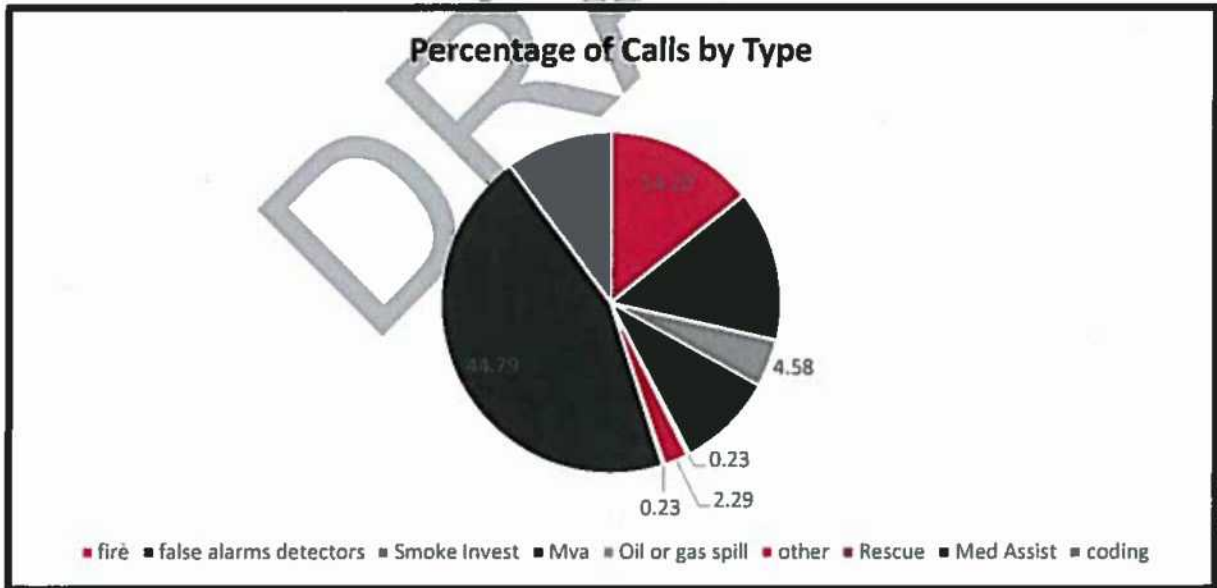


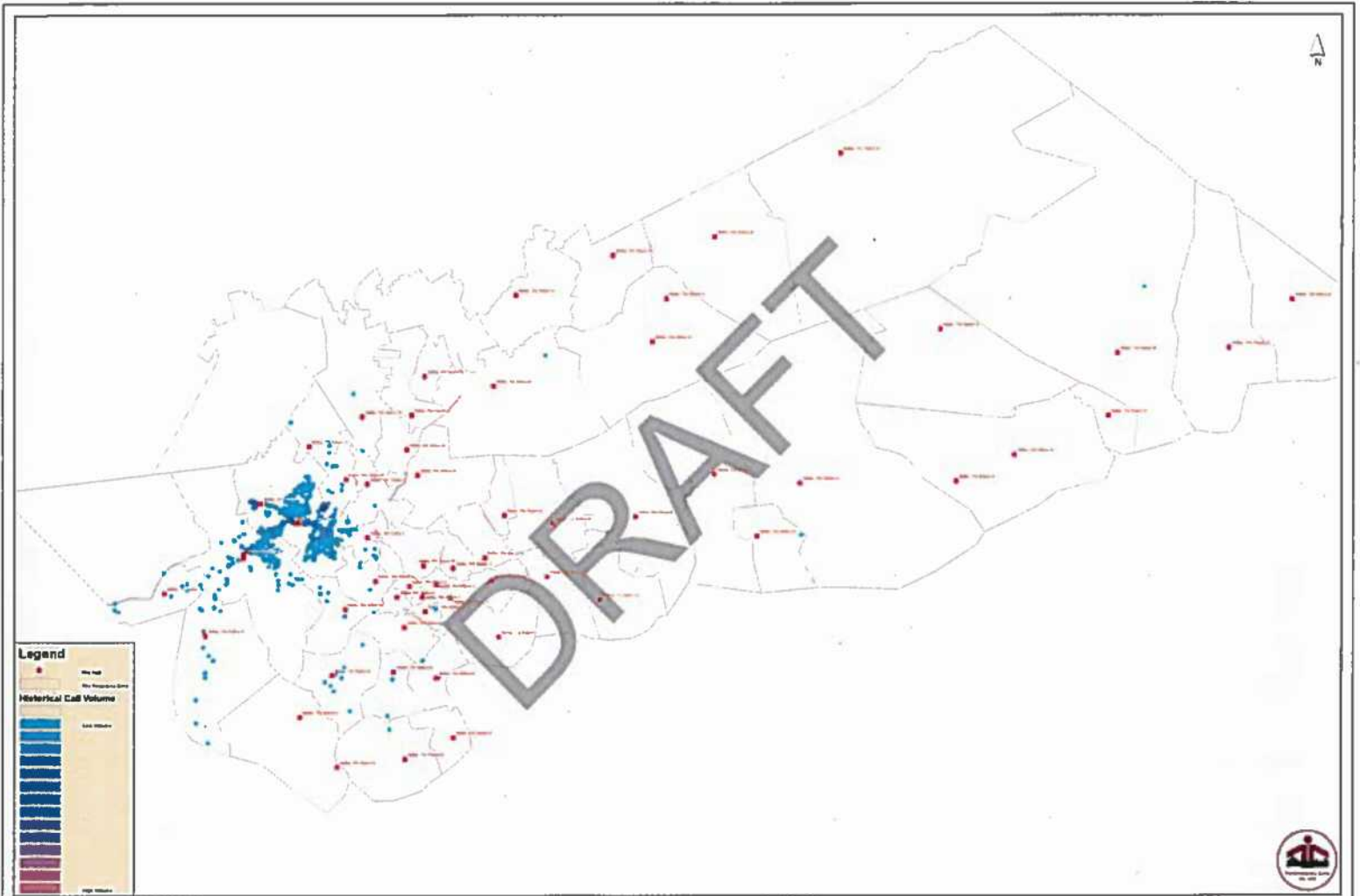
Table 4 is a breakdown of the fire calls by time of day for Station 50. The bulk of the calls are daytime and evening responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	00:00 – 06:59	119	13.6%
Daytime	07:00 – 16:59	451	51.7%
Evening	17:00 – 23:59	303	34.7%

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Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 50 was assigned a Public Fire Protection Classification of 8 and Dwelling Protection Grade 3B.

Recommendations

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



STATION 52
2101 Prospect Road



Station 52 is located in the community of Hatchet Lake in the Halifax Regional Municipality off of Prospect Road. Figure 1 shows the current 2.5km, 5km and 8km response coverage area for Station 52. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by 5 volunteer fire fighters and houses one Tanker.



Building and Tarmac

The station building is concrete with aluminum siding and an aluminum/metal clad roof. The station is two stories and approximately 3,700 square feet.

The tarmac outside the station is an asphalt covered area which extends from the bay door to the street and covers approximately 2,900 square feet. Adjacent to the tarmac is a gravel parking lot. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. Overall the facilities in this station were found to be in average condition. The facilities at the station are not adequate to meet the needs of the firefighters.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.



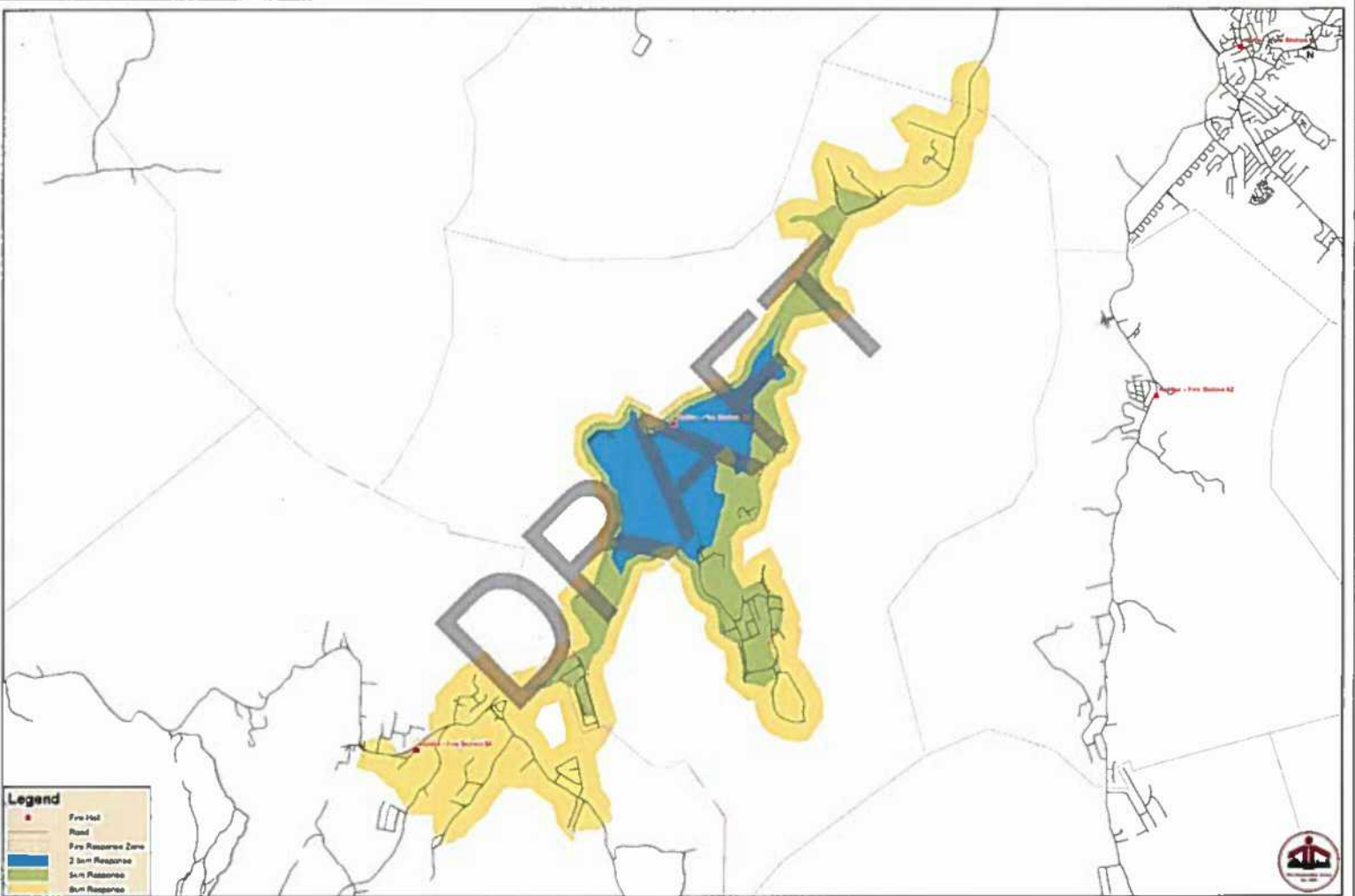


Figure 1 - 2.5/5km Response from Fire Station 52

Scale = 1:18,000

Community Risk Profile – Response Zone 52

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community’s fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 1,513 Required Fire Flows were calculated for Response Zone 52 as shown in Figure 2. The Basic Fire Flows assigned for Station 52 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for this zone is based on the 5th Highest Required Fire Flow value which is 2,100 IGPM.

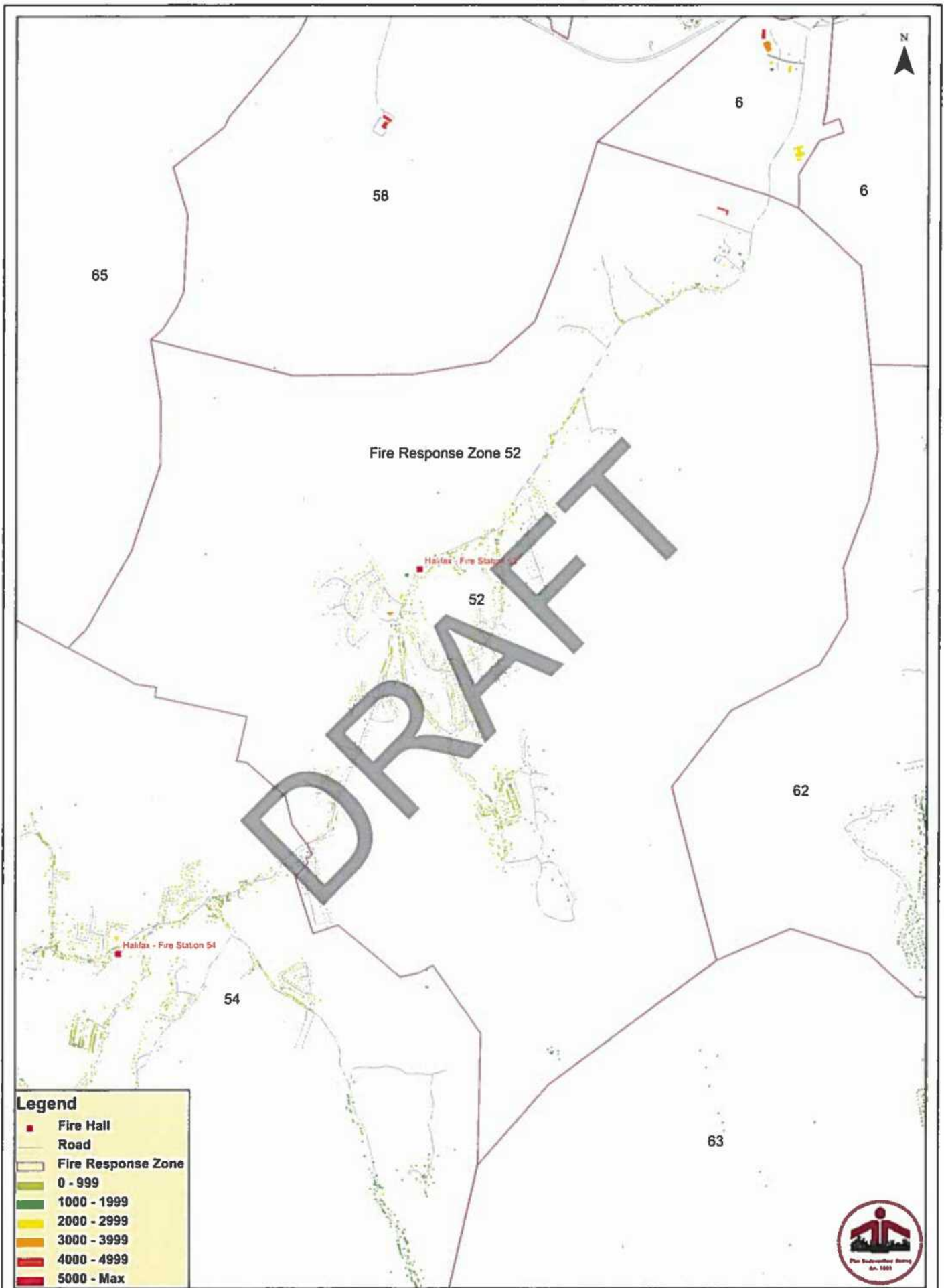
Table 1 Required Fire Flow ranges in Response Zone 52

RFF Range	No. of RFF points
0-999 IGPM	1,094
1000-1999 IGPM	412
2000-2999 IGPM	5
3000-3999 IGPM	1
4000-4999 IGPM	1
>=5000 IGPM	0

Table 2 Basic Fire Flows for HRM Response Zone 52

Total RFF Points	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,400	106.12
Max	4,100	310.78
5th highest	2,100	159.18





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Fire Response Zone 52

Halifax - Fire Station 52

Halifax - Fire Station 54

65

58

6

6

52

62

54

63



Fire Department Survey

Apparatus and Personnel

Based on the Basic Fire Flow of 2,100 IGPM, the benchmark number of apparatus required for Fire Station 52 is two Engine apparatus. Station 52 is equipped with one Tanker and no Engine. Standard staffing for Station 52 is 5 volunteers, which is well below the minimum of 15 volunteers or four full-time staff required on a fire department roster to provide adequate response and be recognized for fire insurance grading purposes.

Fire Calls

In the period from January 2010 until September 2013, Station 52 had 436 emergency calls with the following breakdown as shown in Table 3 and Figure 3 and 4 below. Calls labelled as “Other” and “Coding” include calls whereby apparatus returned to the station or those for which the type of call could not be identified.

The majority of calls to Station 52 were Medical emergencies at 53 percent of the total call volume.

Table 3 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year Average	Percentage (%)
Fire	57	15	13.07
False alarm	36	10	8.26
Smoke	17	5	3.90
MVA	44	12	10.09
Oil or Gas spill	0	0	0.00
Other	7	2	1.61
Rescue	1	0	0.23
Med Assist	233	62	53.44
Coding	41	11	9.40



Figure 3 Emergency Calls by Incident Type (2010-2013)

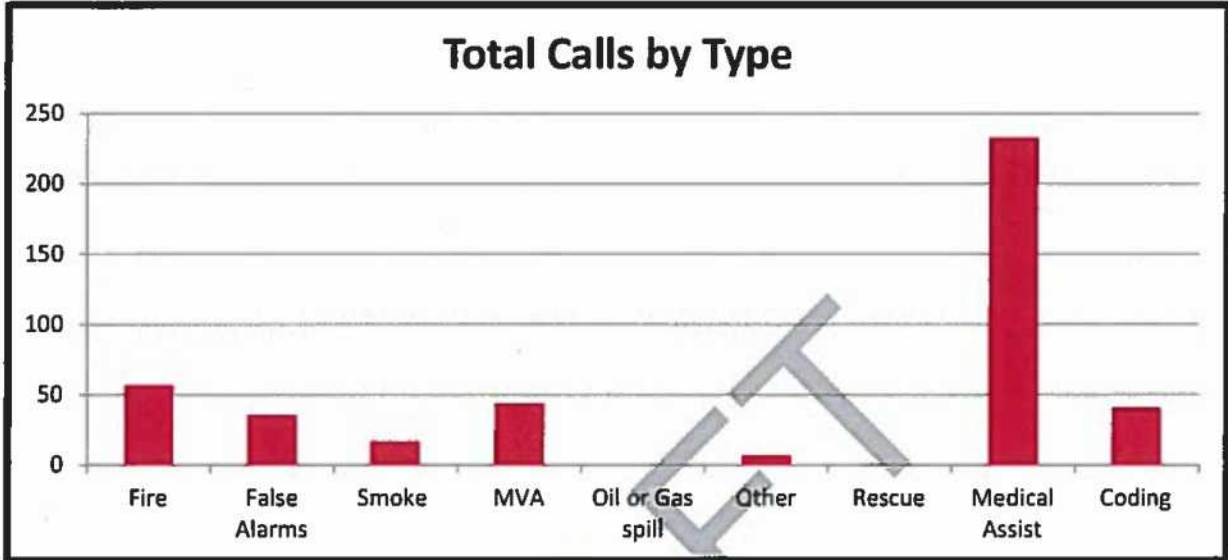


Figure 4 Percentage of Calls by Incident Type (2010-2013)

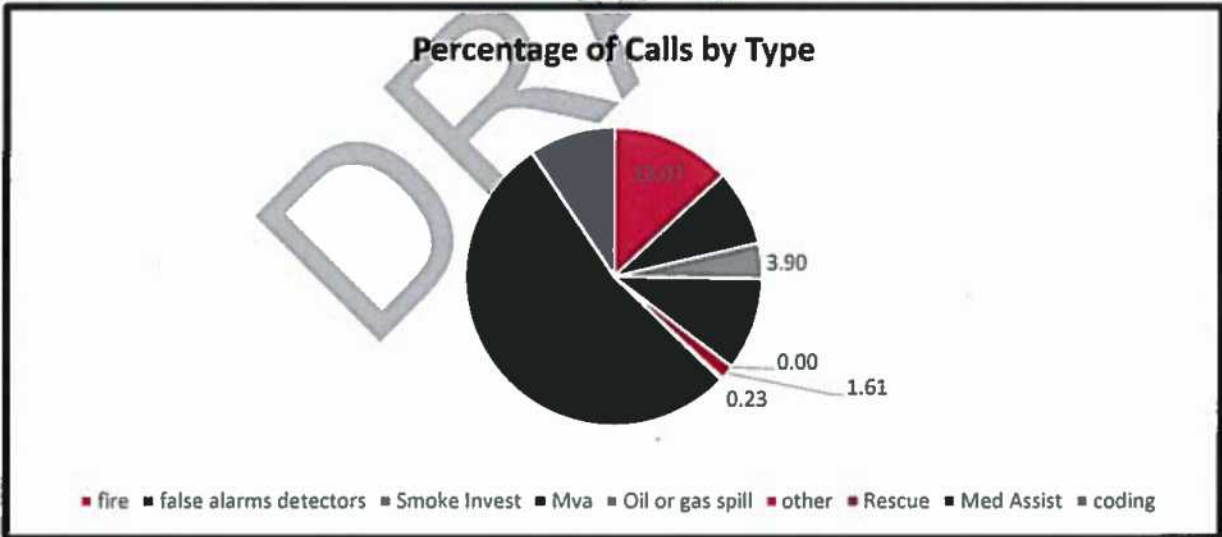


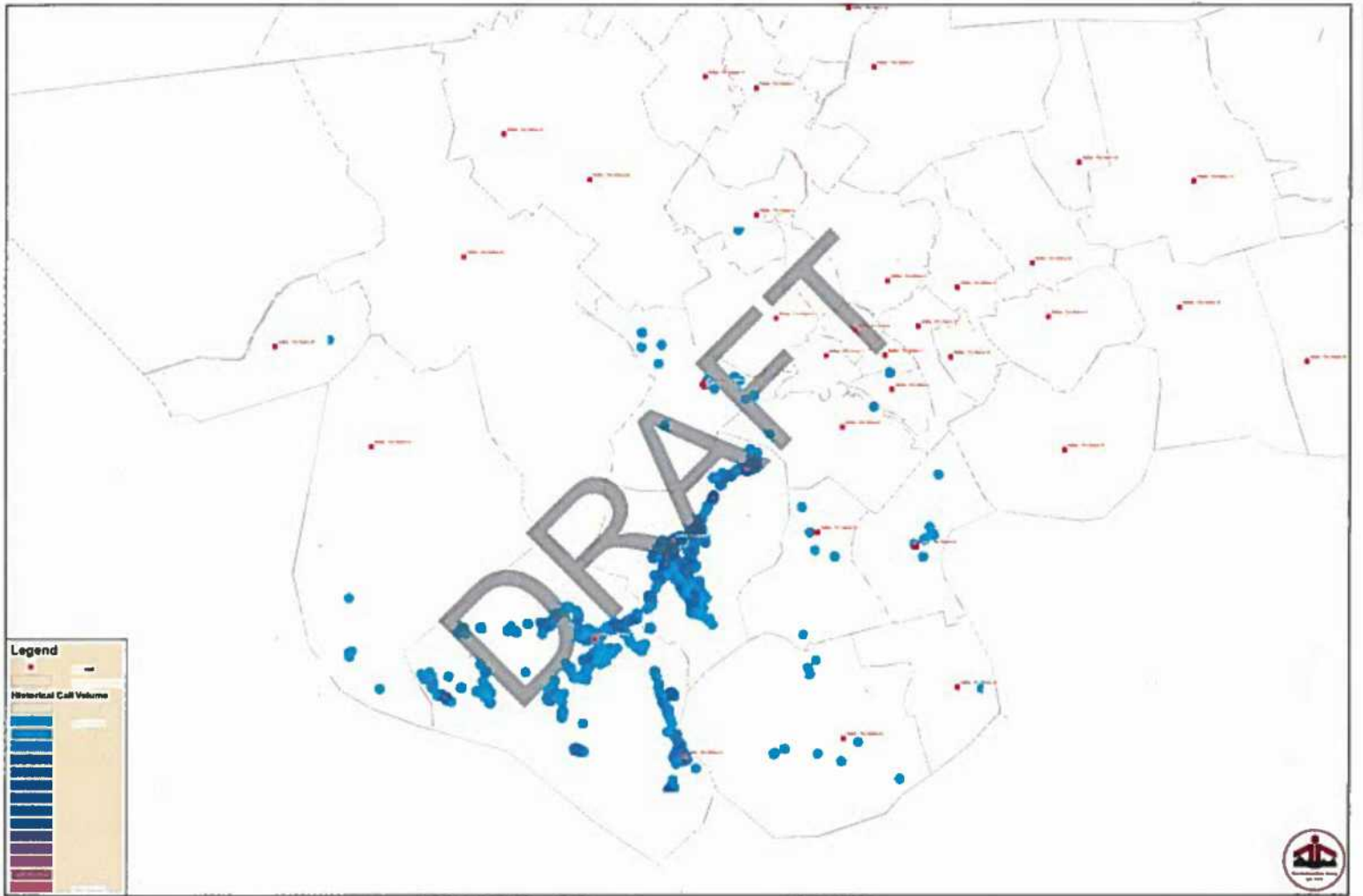
Table 4 is a breakdown of the fire calls by time of day for Station 52. The majority of calls are daytime and evening responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	00:00 – 06:59	59	13.5%
Daytime	07:00 – 16:59	202	46.3%
Evening	17:00 – 23:59	175	40.2%

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Scale bar



Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 52 was assigned a Public Fire Protection Classification of 10 and Dwelling Protection Grade 5.

Recommendations

- Close Station 52. The number of volunteer firefighters at Station 52 is well below the minimum staffing requirements of 15 volunteer fire fighters for response to the risks in this area and for fire insurance grading purposes. In addition the apparatus at this station does not meet the requirements as determined by the Basic Fire Flow in the response zone. Due to staffing and apparatus deficiencies, the station response is not recognized for fire insurance grading. Operating this station therefore presents an undue cost with no corresponding insurance savings. The station is redundant and should be closed.



STATION 54
3610 Prospect Road



Station 54 is located in the community of Shad Bay in the Halifax Regional Municipality. Figure 1 shows the current 2.5 km, 5 km and 8 km response coverage area for Station 54. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents (8 km coverage) the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by 23 volunteer fire fighters and an E-platoon during day time hours, and houses one Engine and a Tanker.

Building and Tarmac

The station is a concrete building with vinyl and wood siding with an asphalt shingle roof. The building is one story and approximately 3,400 square feet. The tarmac outside the station is an asphalt covered area which extends from the bay door to the street. Adjacent to the tarmac is a small parking area. The



tarmac covers approximately 2,200 square feet. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

Facilities

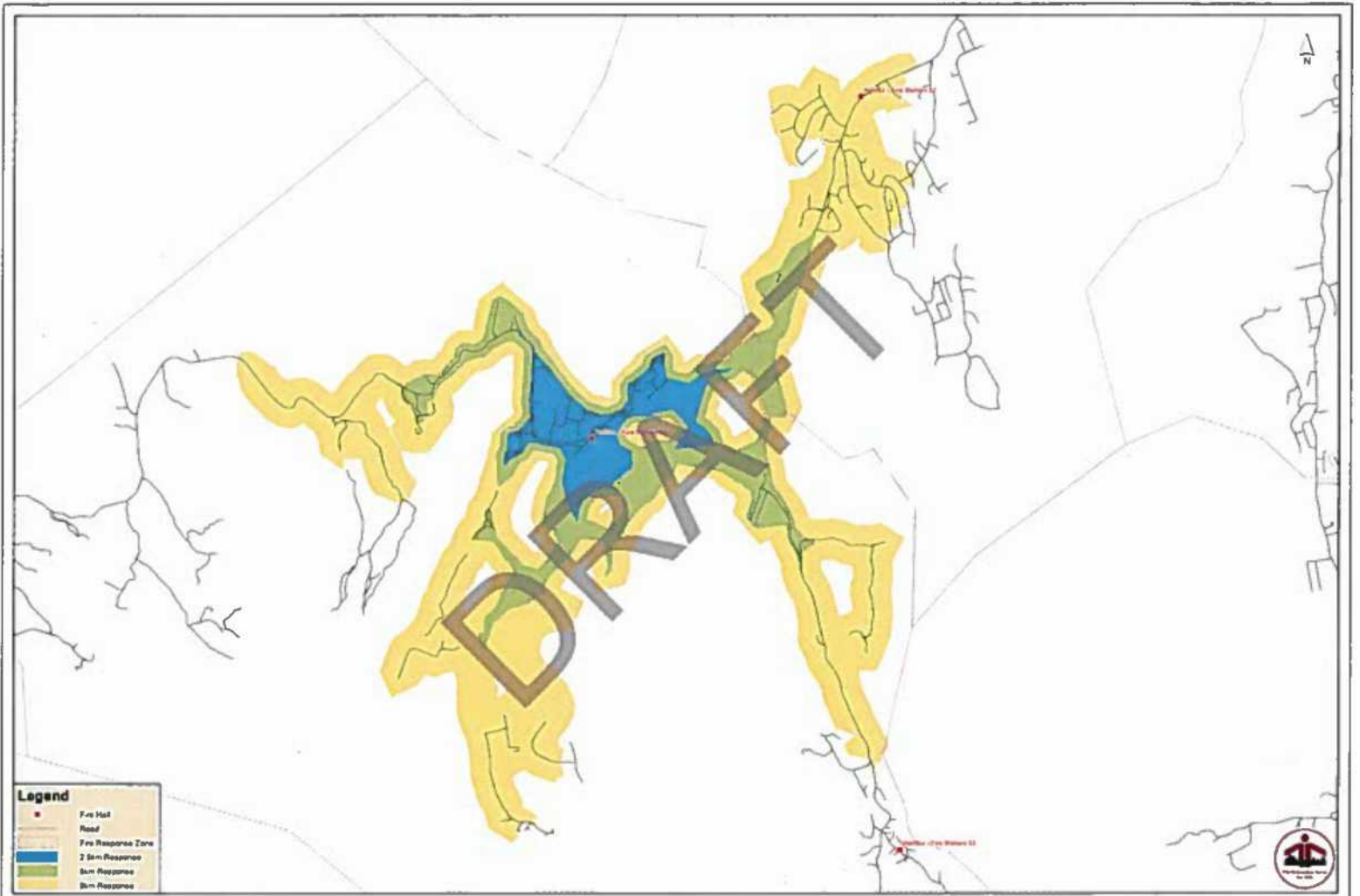
Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. Overall the facilities in this Station were found to be in good condition.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

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Legend

- Fire Station
- Road
- Fire Response Zone
- 2 km Response
- 5 km Response
- 8 km Response

Figure 1 - 2.5/5/8km Response from Fire Station 54

Scale = 1:17,000

Community Risk Profile – Response Zone 54

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community’s fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 2,388 Required Fire Flows were calculated for Response Zone 54 as shown in Figure 2. The Basic Fire Flows assigned for Station 54 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 90th or 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited to large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for this zone is based on the 90th Percentile Required Fire Flow value which is 1,200 IGPM.

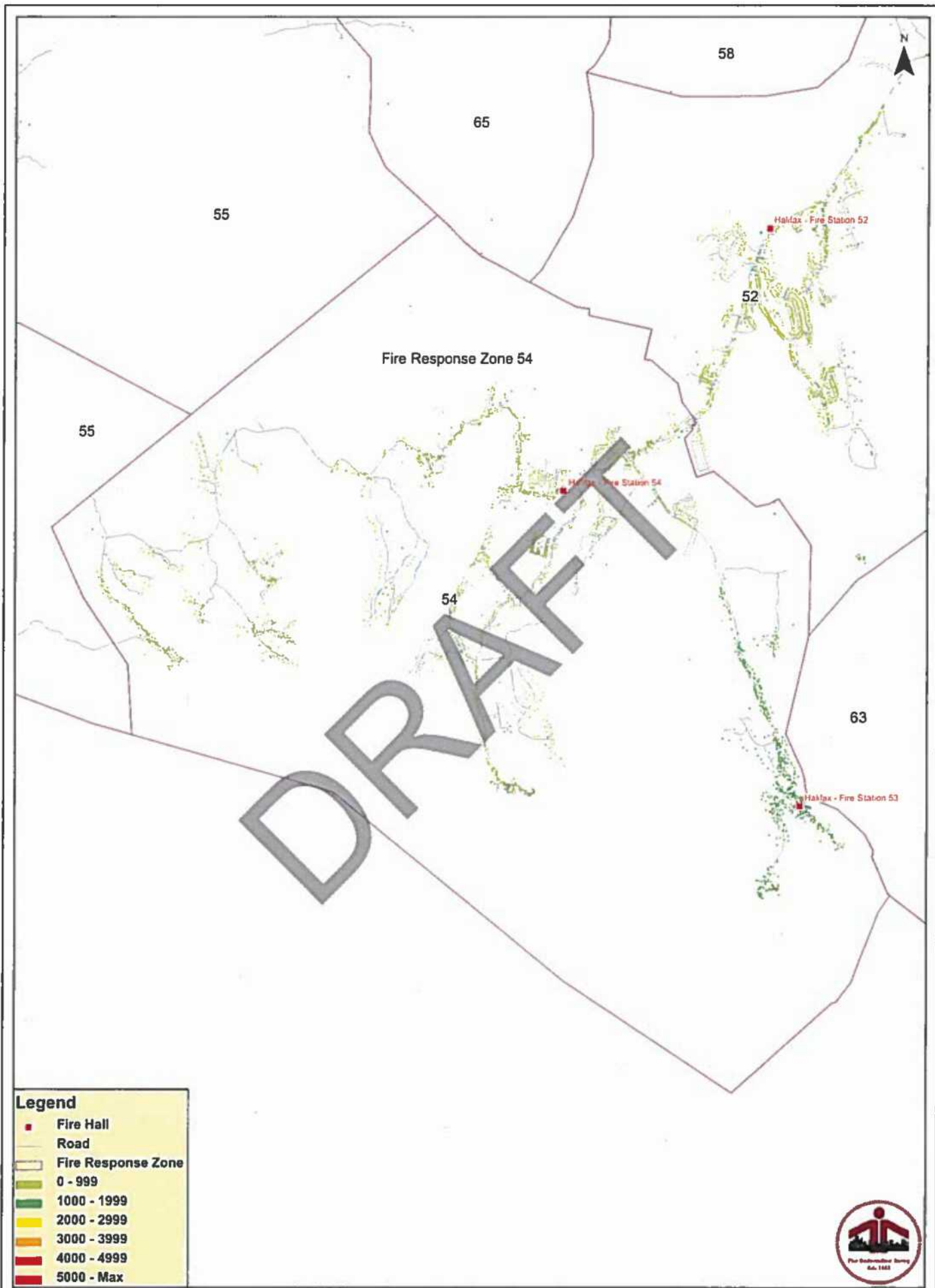
Table 1 Required Fire Flow ranges in Response Zone 54

RFF Range	No. of RFF points
0-999 IGPM	1,537
1,000-1,999 IGPM	844
2,000-2,999 IGPM	6
3,000-3,999 IGPM	1
4,000-4,999 IGPM	0
>=5,000 IGPM	0

Table 2 Basic Fire Flows for HRM Response Zone 54

Total RFF Points	2,388	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,200	90.96
Max	3,100	234.98
5th highest	2,100	159.18





Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 54 is one Engine apparatus. Station 54 is equipped with one Engine. Standard staffing for Station 54 is 23 volunteers. While the E-platoon provides daytime coverage, the number of volunteers is adequate to meet the response requirements during the evening and overnight hours. Station 54 has a string volunteer base on which the area can build.

Fire Calls

In the period from January 2010 until September 2013 Station 54 received a total of 577 emergency calls with the following breakdown as shown in Table 3 and Figure 3 and 4 below.

The majority of calls to this station were Medical calls at 60% of the total call volume.

Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls that could not be identified.

Table 3 Emergency calls by Incident Type

Call by type			
Type	Total	Year Average	Percentage (%)
Fire	83	22	14.38
False alarm	40	11	6.93
Smoke	18	5	3.12
Motor Vehicle Accidents	52	14	9.01
Oil or Gas spill	0	0	0.00
Other	9	2	1.56
Rescue	2	1	0.35
Medical Assist	351	94	60.83
Coding	22	6	3.82



Figure 3 Emergency Calls by Incident Type (2010-2013)

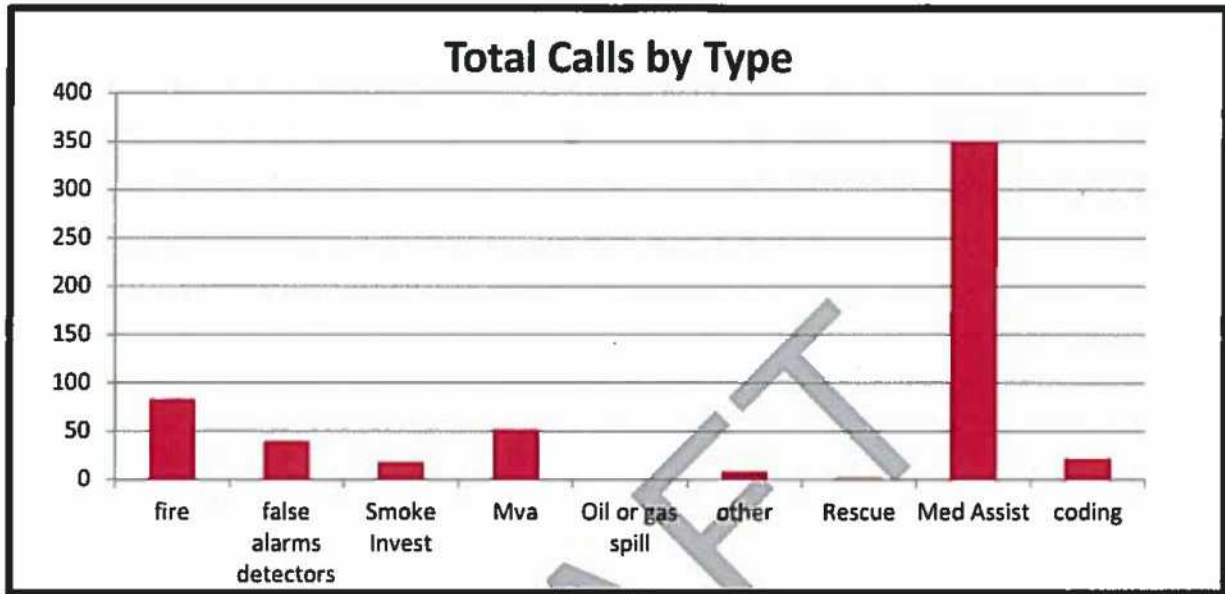


Figure 4 Percentage of Calls by Incident Type (2010-2013)

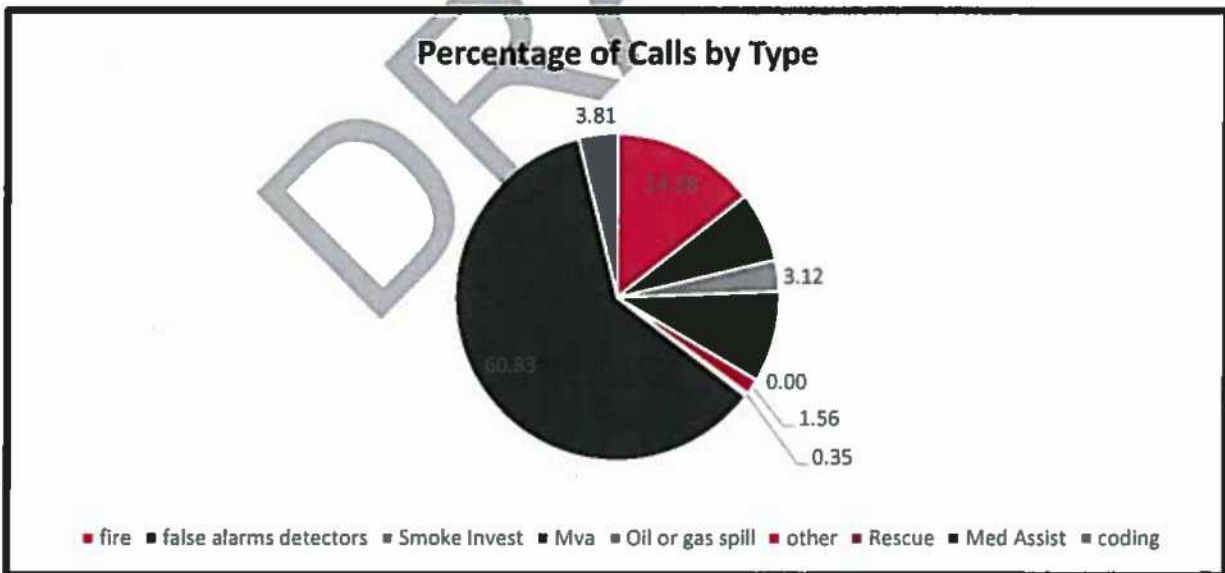


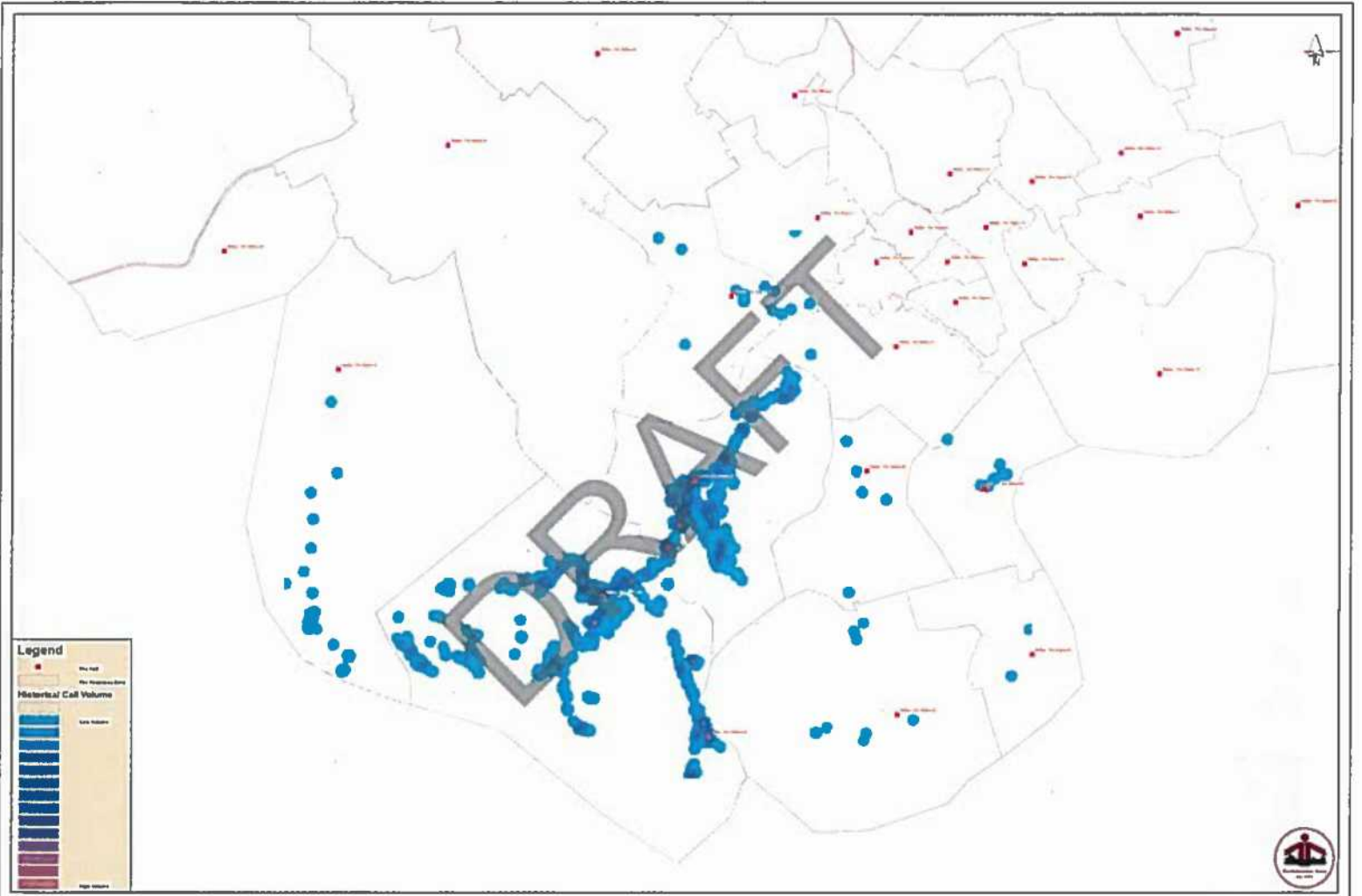
Table 4 is a breakdown of the fire calls by time of day for Station 54. The bulk of the calls are daytime and evening responses in this area. The E-platoon staff is available to respond to day time calls while the volunteers provide adequate response for evening and overnight emergency calls.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	69	11.9%
Daytime	0700 – 1659	299	51.8%
Evening	1700 – 2359	209	36.3%

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Legend

- Fire Call
- Fire Substation

Historical Call Volume

- Very High
- High
- Medium
- Low
- Very Low

Figure 5 Historical Call Map - Fire Station 54

Scale = 1:50,000

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 54 was assigned a Public Fire Protection Classification of 8 and Dwelling Protection Grade 3B.

Recommendations

- The E-platoon at this station is only beneficial for daytime hours. The number of volunteers is sufficient to provide adequate response during evening and overnight hours. Maintain composite staffing at this station with the E-Platoon for daytime response and volunteer staffing for evening and overnight calls.



STATION 55
2101 Prospect Road



Station 55 is located in the community of Seabright in the Halifax Regional Municipality. Figure 1 shows the current 2.5km, 5km and 8km response coverage area for Station 55. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is currently staffed by 19 volunteers and houses one Engine, a Tanker, a Rescue unit, a Tactical Support unit, and a Tow Vehicle.



Building and Tarmac

The station is a partly concrete, partly wood-frame building with vinyl siding and an asphalt shingle roof. The building is one story and approximately 4,000 square feet. The tarmac outside the station is an asphalt covered area which extends from the bay door to the street. Adjacent to the tarmac is a small parking area. The tarmac covers approximately 3,800 square feet. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

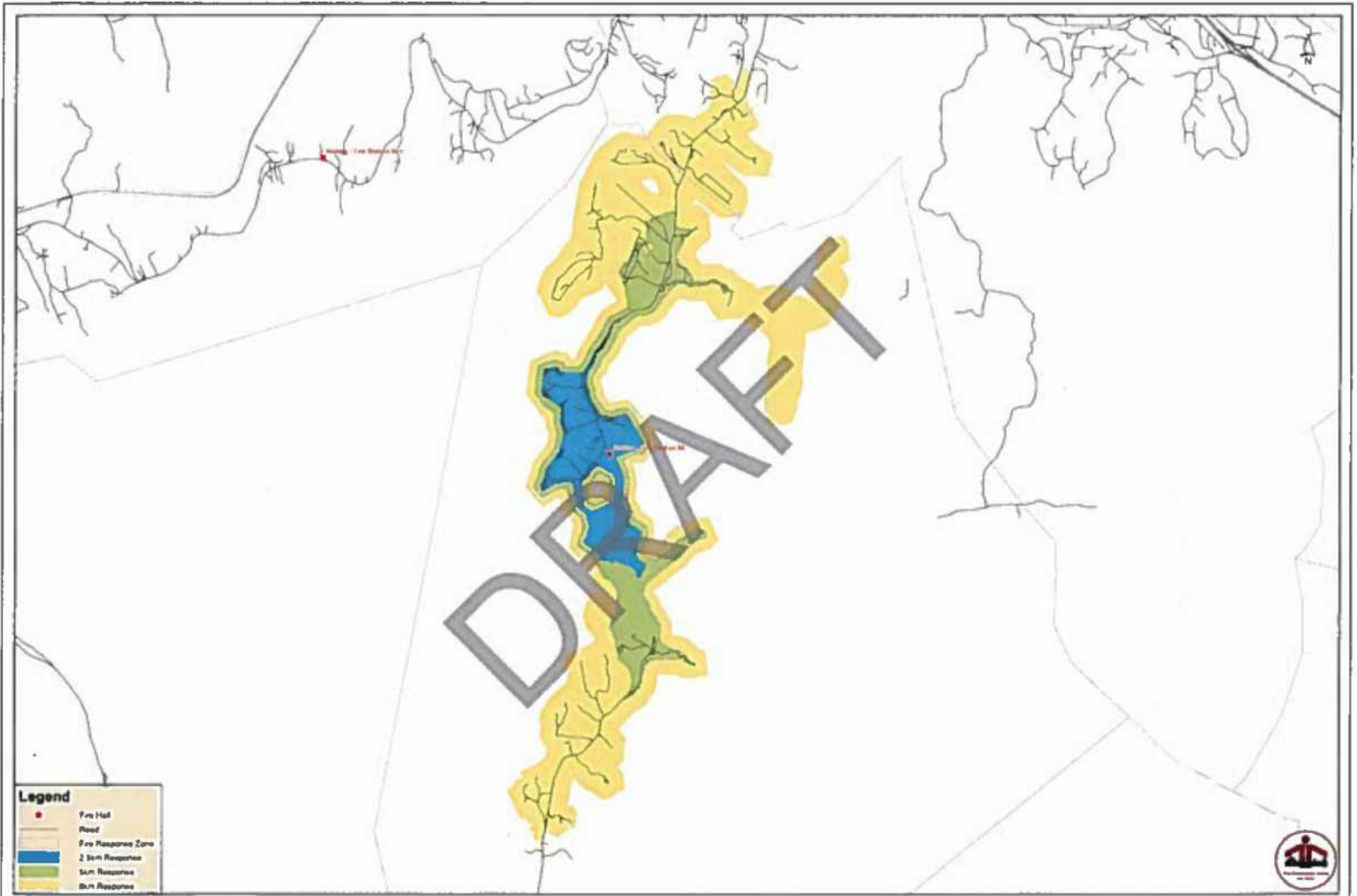
Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. There is no air conditioning in the station and the water available is not suitable for drinking. The facilities are not well suited for career staffing.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.





Community Risk Profile – Response Zone 55

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 1,673 Required Fire Flows were calculated for Response Zone 55 as shown in Figure 2. The Basic Fire Flows assigned for Station 55 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited to large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for this zone is based on the 95th Percentile Required Fire Flow value which is 1,200 IGPM.

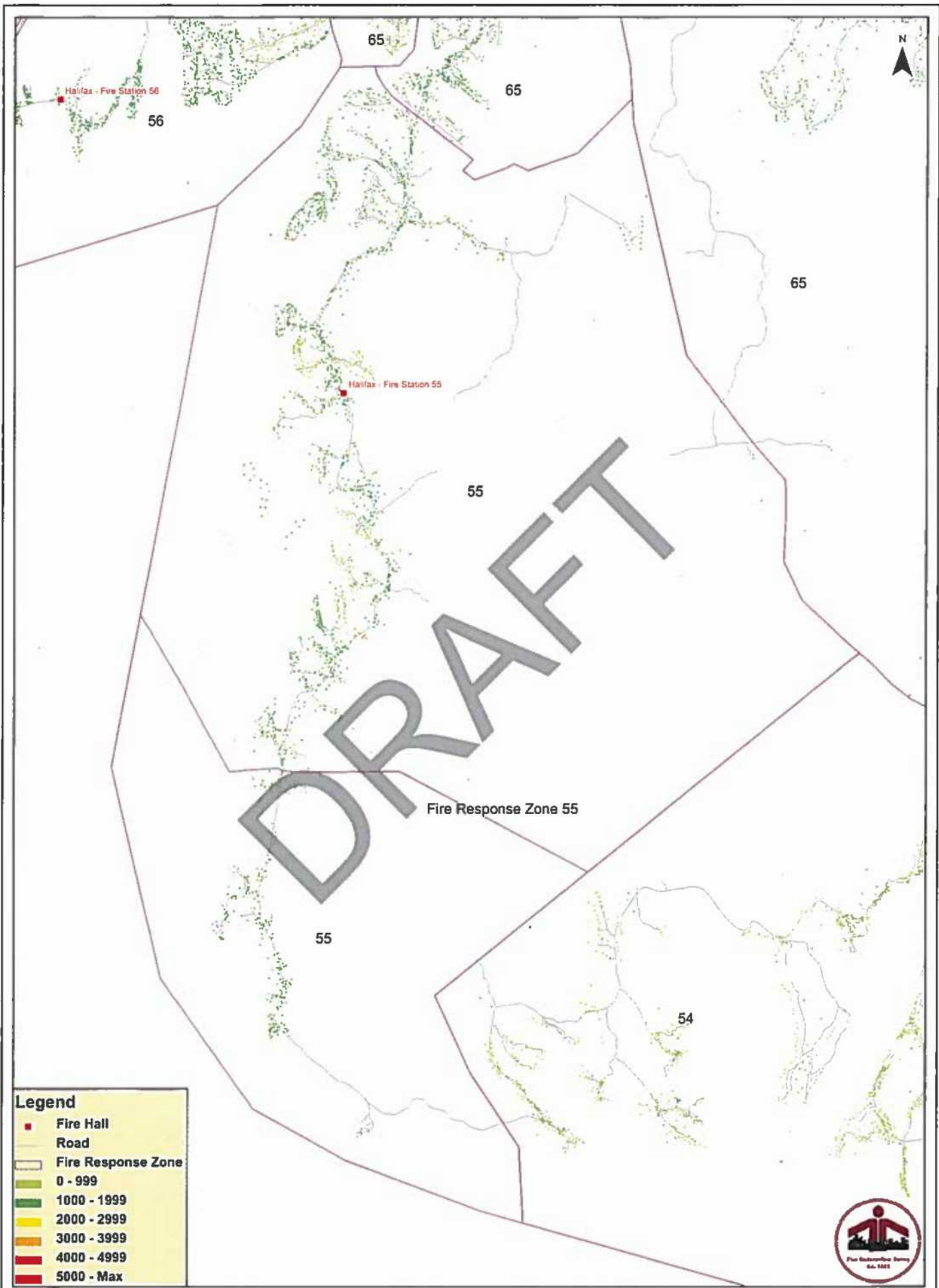
Table 1 Required Fire Flow ranges in Response Zone 55

RFF Range	No. of RFF points
0-999 IGPM	260
1000-1999 IGPM	1,407
2000-2999 IGPM	5
3000-3999 IGPM	1
4000-4999 IGPM	0
>=5000 IGPM	0

Table 2 Basic Fire Flows for HRM Response Zone 55

Total RFF Points	1,673	
	IGPM	L/s
90th Percentile	1,000	75.80
95th Percentile	1,200	90.96
Max	3,000	227.40
5th highest	2,000	151.60





Legend

	Fire Hall
	Road
	Fire Response Zone
	0 - 999
	1000 - 1999
	2000 - 2999
	3000 - 3999
	4000 - 4999
	5000 - Max



Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 55 is one Engine apparatus. Station 55 is equipped with one Engine. Standard staffing for Station 55 is 19 volunteers, which meets the minimum requirement of 15 volunteer firefighters required on a fire department roster to provide adequate response and be recognized for fire insurance grading purposes.

Fire Calls

In the period from January 2010 until September 2013, Station 55 had 477 emergency calls with the following breakdown as shown in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or those for which the type could not be identified.

The majority of calls to Station 55 were Medical emergencies at 51.5 percent of the total call volume.

Table 3 Emergency calls by Incident Type

Call by type			
Type	Total	Year Average	Percentage (%)
Fire	50	13	10.48
False alarm	56	15	11.74
Smoke	19	5	4.19
Motor Vehicle Accident	36	10	7.55
Oil or Gas spill	0	0	0.00
Other	9	2	1.89
Rescue	3	1	0.63
Medical Assist	243	65	51.57
Coding	56	15	11.95



Figure 3 Emergency Calls by Incident Type (2010-2013)

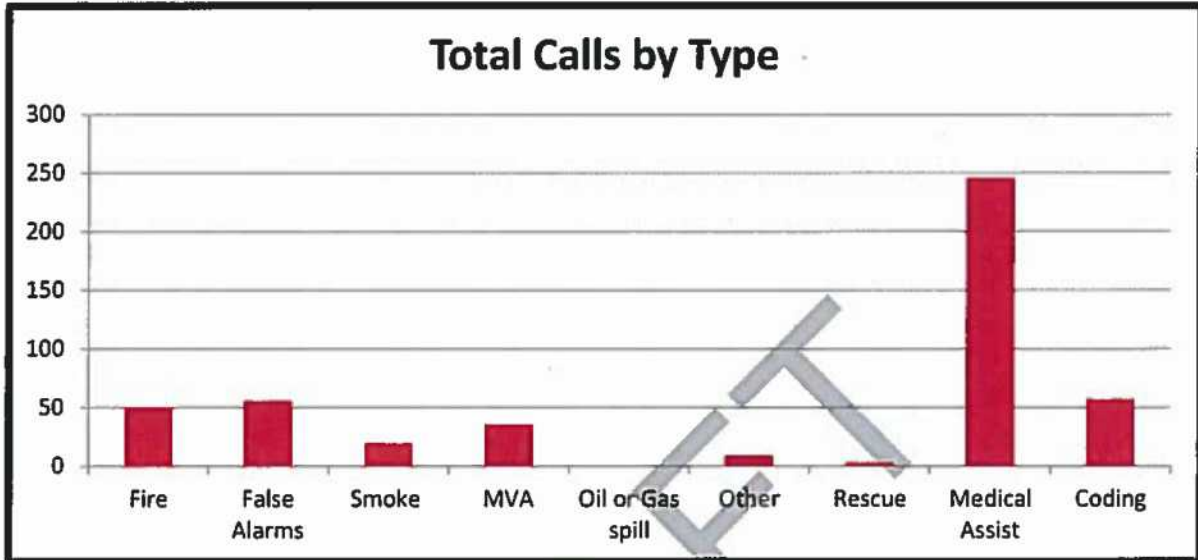


Figure 4 Percentage of Calls by Incident Type (2010-2013)

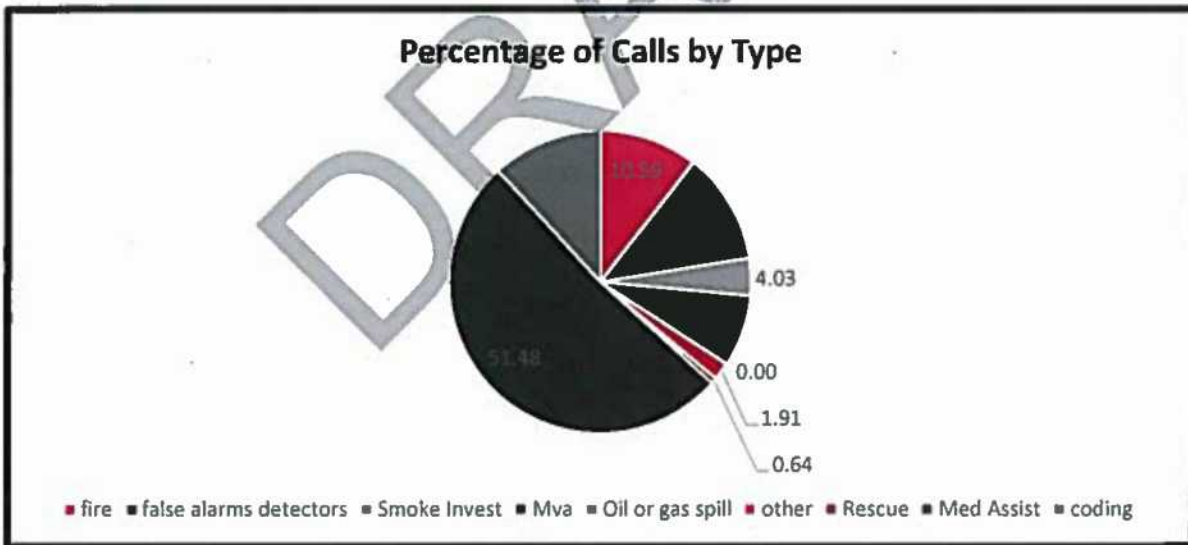


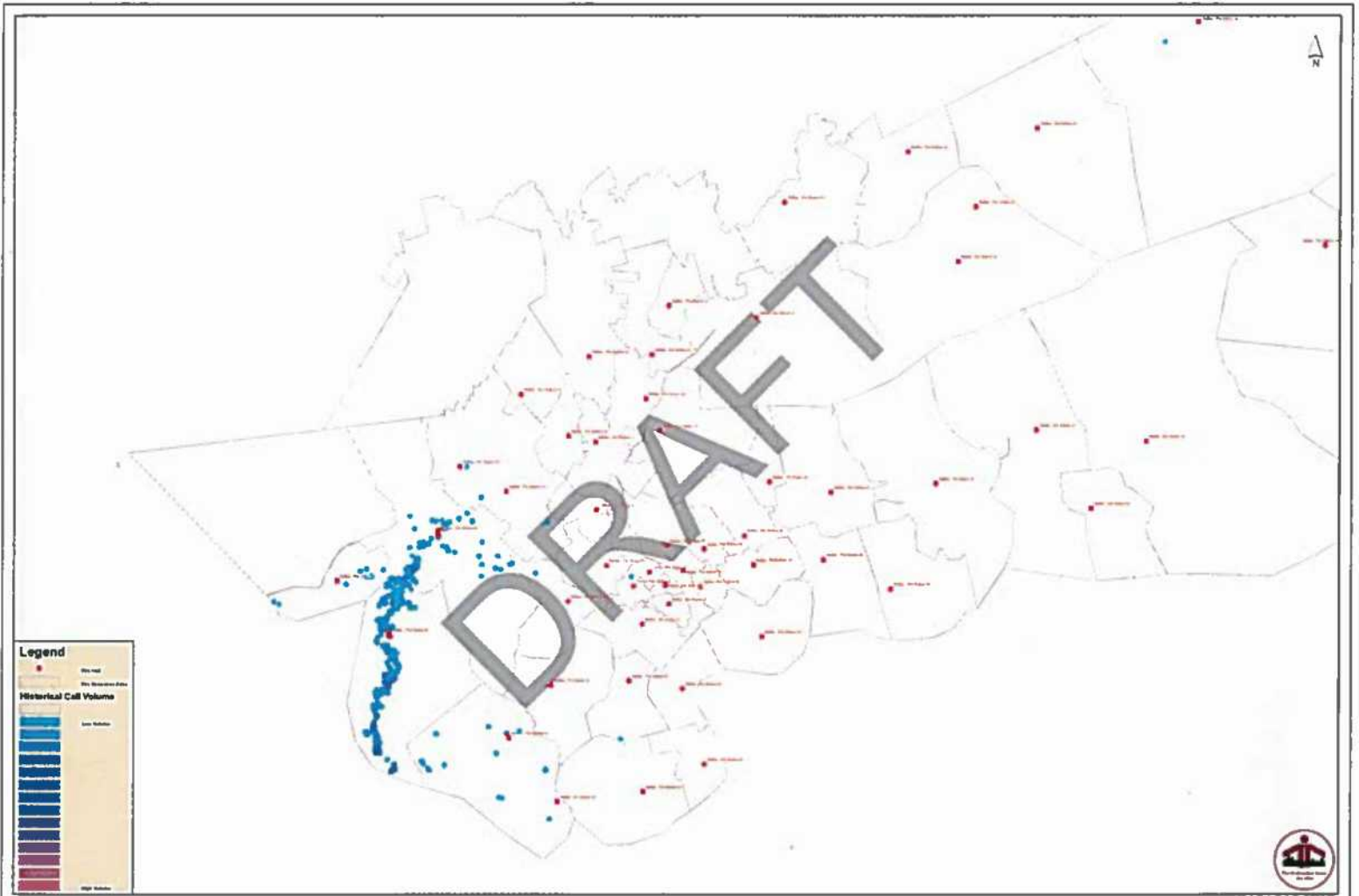
Table 4 is a breakdown of the fire calls by time of day for Station 55. The majority of the calls are daytime and evening responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	00:00 – 06:59	56	11.7%
Daytime	07:00 – 16:59	258	54.1%
Evening	17:00 – 23:59	163	34.2%

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Legend

- Five Station

Historical Call Volume

High Volume
Medium-High Volume
Medium Volume
Medium-Low Volume
Low Volume
Very Low Volume

Figure 5 Historical Call Map - Five Station 55

Scale = 1:110,000

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 55 was assigned a Public Fire Protection Classification of 8 and Dwelling Protection Grade 3B.

Recommendations

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



STATION 56

8579 St. Margarets Bay Road



Station 56 is located in the community of Black Point off of St Margarets Bay road in the Halifax Regional Municipality. Figure 1 shows the current 2.5km, 5km and 8km response coverage area for Station 56. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is currently staffed by 8 volunteers and houses one Engine, a Tanker, a Rescue unit, a Tactical Support unit, and a Tow Vehicle.



Building and Tarmac

The station is constructed of concrete block with a metal clad, steel truss roof. The two story station is approximately 9,500 square feet. It is fully sprinklered and is equipped with a fire alarm system with heat and smoke detectors. There are fire alarm pull stations by each exit.

The tarmac outside the station is an asphalt covered area which extends from the bay door to the street and covers approximately 7,500 square feet. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines. Adjacent to the tarmac is a gravel parking lot for volunteer fire fighters.

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. Overall the station was found to be good condition. However the tidiness and upkeep of the facilities needs improvement.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.





Figure 1 - 2.5/5/8km Response from Fire Station 56

Community Risk Profile – Response Zone 56

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community’s fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 1,605 Required Fire Flows were calculated for Response Zone 56 as shown in Figure 2. The Basic Fire Flows assigned for Station 56 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for this zone is based on the 95th Percentile Required Fire Flow value which is 1,200 IGPM.

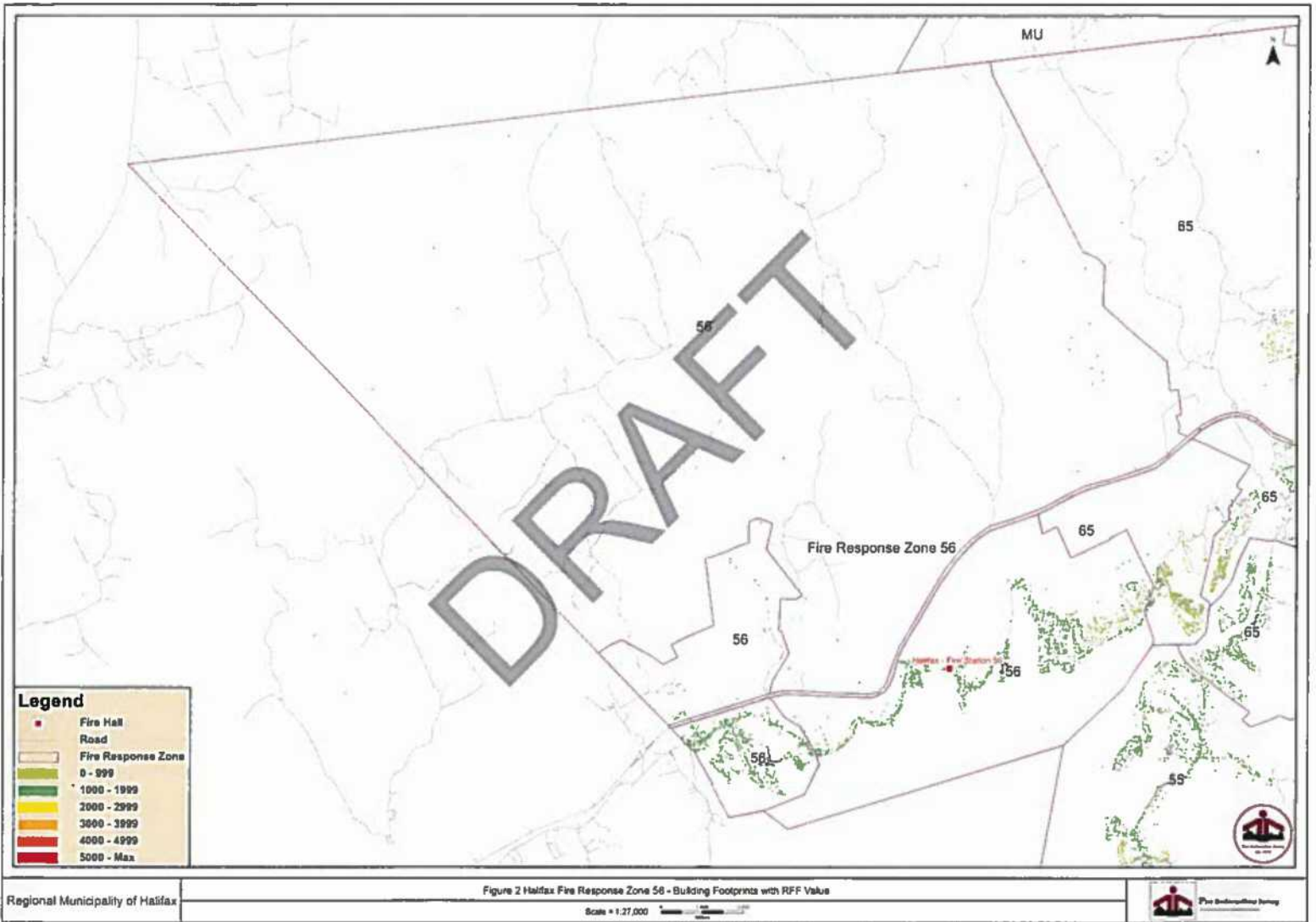
Table 1 Required Fire Flow ranges in Response Zone 56

RFF Range	No. of RFF points
0-999 IGPM	169
1000-1999 IGPM	1,426
2000-2999 IGPM	10
3000-3999 IGPM	0
4000-4999 IGPM	0
>=5000 IGPM	0

Table 2 Basic Fire Flows for HRM Response Zone 56

Total RFF Points	1,605	
	IGPM	l/s
90th Percentile	1,200	90.96
95th Percentile	1,200	90.96
Max	2,600	197.08
5th highest	2,300	174.34





Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 56 is one Engine apparatus. Station 56 is equipped with one Engine. Standard staffing for Station 56 is 8 volunteers, which is well below the minimum of 15 volunteers or four full-time staff required on a fire department roster to provide adequate response and be recognized for fire insurance grading purposes.

Fire Calls

In the period from January 2010 until September 2013, Station 56 received 442 emergency calls with the following breakdown as shown in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or those for which the type of call could not be identified.

The majority of calls to Station 56 were Medical emergencies at 47 percent of the total call volume.

Table 3 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year Average	Percentage (%)
Fire	58	15	13.12
False alarm	38	10	8.60
Smoke	19	5	4.30
Motor Vehicle Accident	31	8	7.01
Oil or Gas spill	0	0	0.00
Other	16	4	3.62
Rescue	4	1	0.90
Medical Assist	208	55	47.06
Coding	68	18	15.39



Figure 3 Emergency Calls by Incident Type (2010-2013)

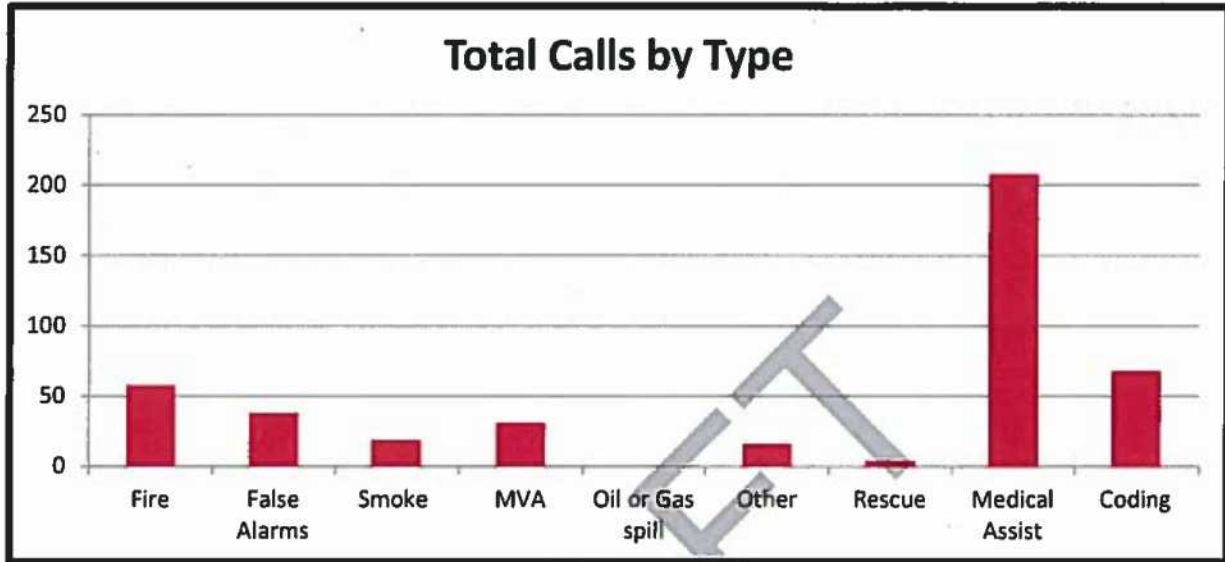


Figure 4 Percentage of Calls by Incident Type (2010-2013)

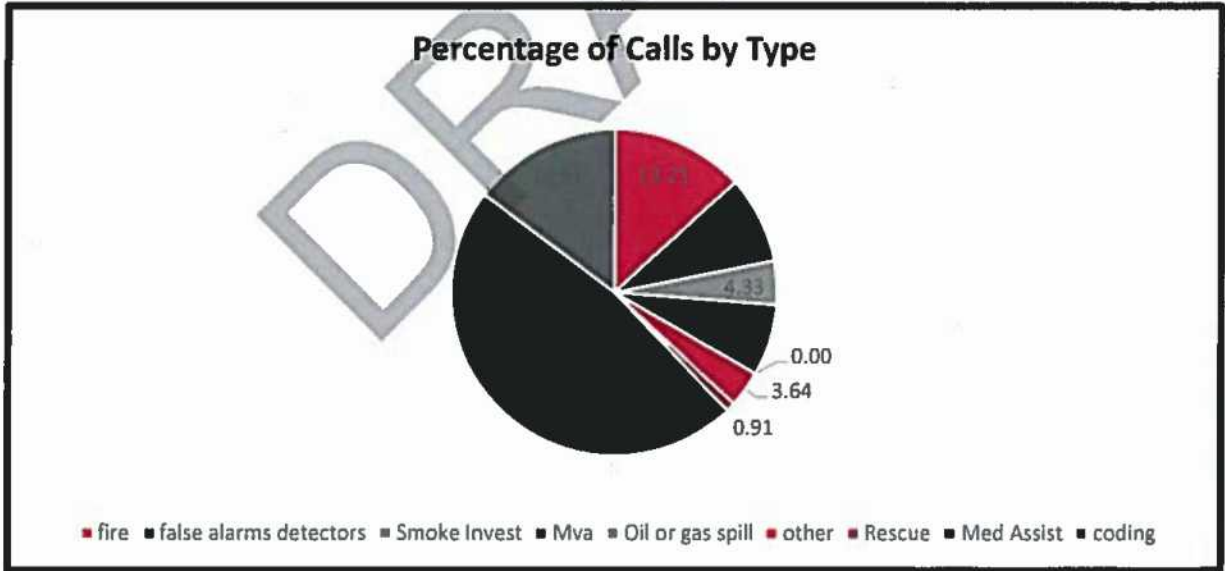


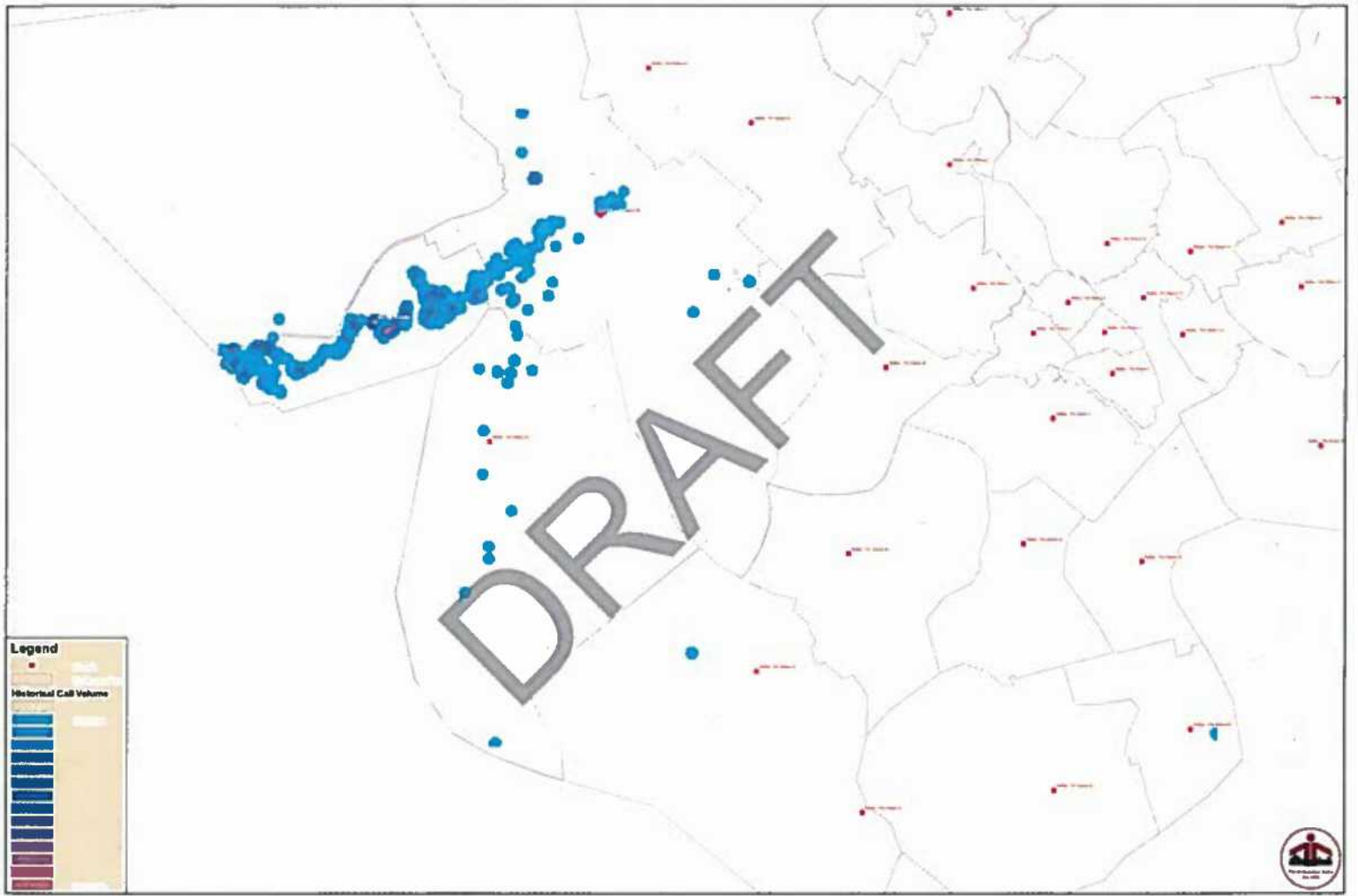
Table 4 is a breakdown of the fire calls by time of day for Station 56. The bulk of the calls are daytime and evening responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	00:00 – 06:59	48	10.9%
Daytime	07:00 – 16:59	233	52.7%
Evening	17:00 – 23:59	161	36.4%

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Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 56 was assigned a Public Fire Protection Classification of 10 and Dwelling Protection Grade 5.

Recommendations

- Increase the number of volunteers at this Station to a minimum of 15 firefighters.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 58
26 Myra Road



Station 58 is located at 26 Myra Road in Timberlea. The station is located in a fairly central position for response to its overall coverage area. Figure 1 shows the 2.5km, 5km and 8km coverage from Station 58.

Building and Tarmac

All fire stations should be of substantial construction, suitable for the service, and located and arranged for ease and quickness of response. The building is wood framed with vinyl siding and the roof construction is of wood frame with asphalt shingle covering.

The tarmac outside the station is an asphalt covered area which extends from the bay door to the street. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.



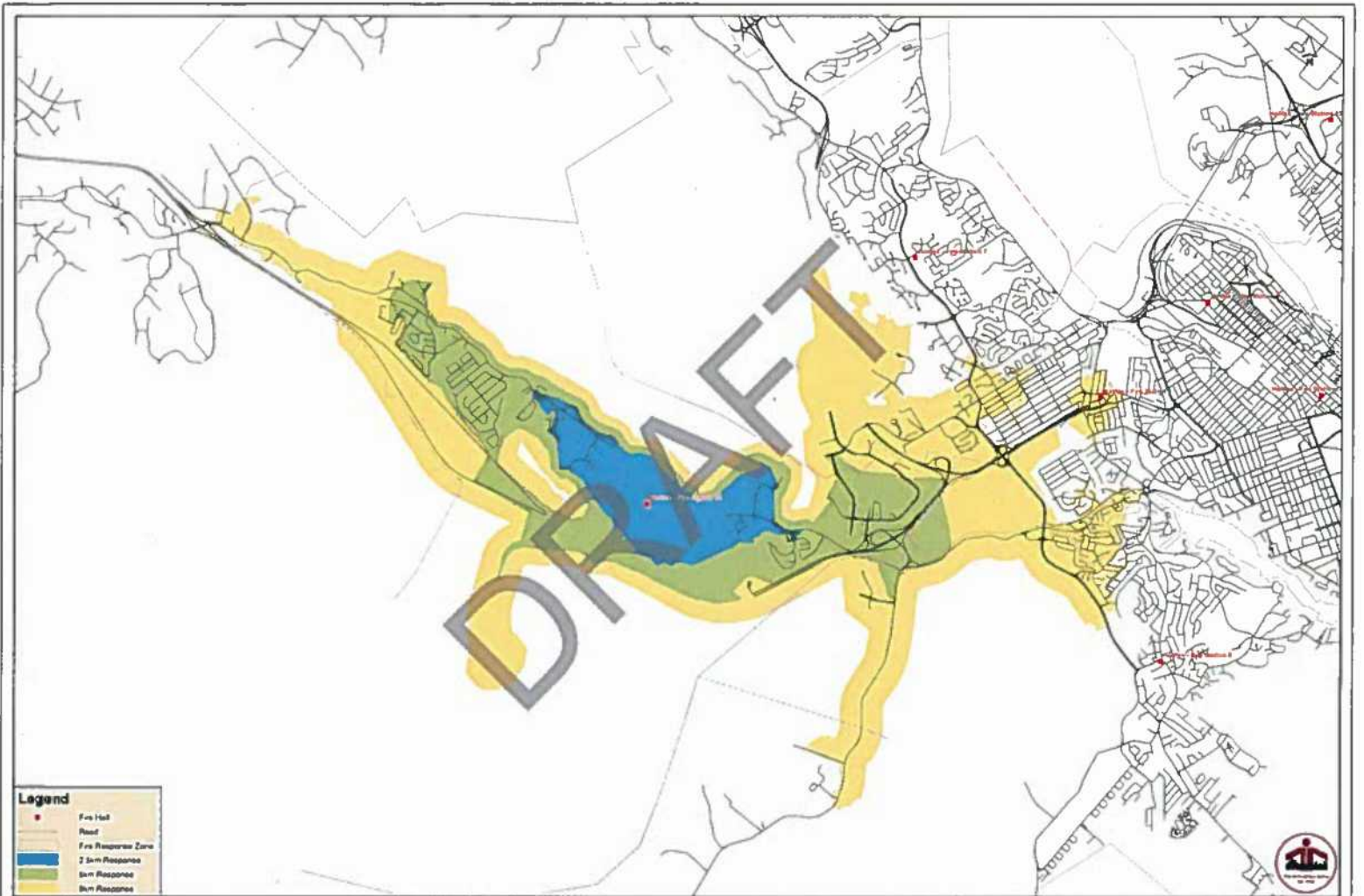


Figure 1 - 2.5/5km Response from Fire Station 56

Scale = 1:16,000

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The Station has a number of crew facilities including sleeping quarters on the second level, a kitchen, dining area, washroom, exercise room, locker room and a day room on the main level. Apparatus bays are located in the same building. The facilities are adequate to meet the needs of the fire fighters. However the station should be better organized and tidy.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

Community Risk Profile – Response Zone 58

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 3,551 Required Fire Flows were calculated for Response Zone 58 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 58

RFI Range	No. of RFI points
0-999 IGPM	508
1000-1999 IGPM	2,993
2000-2999 IGPM	33
3000-3999 IGPM	12
4000-4999 IGPM	3
>=5000 IGPM	2

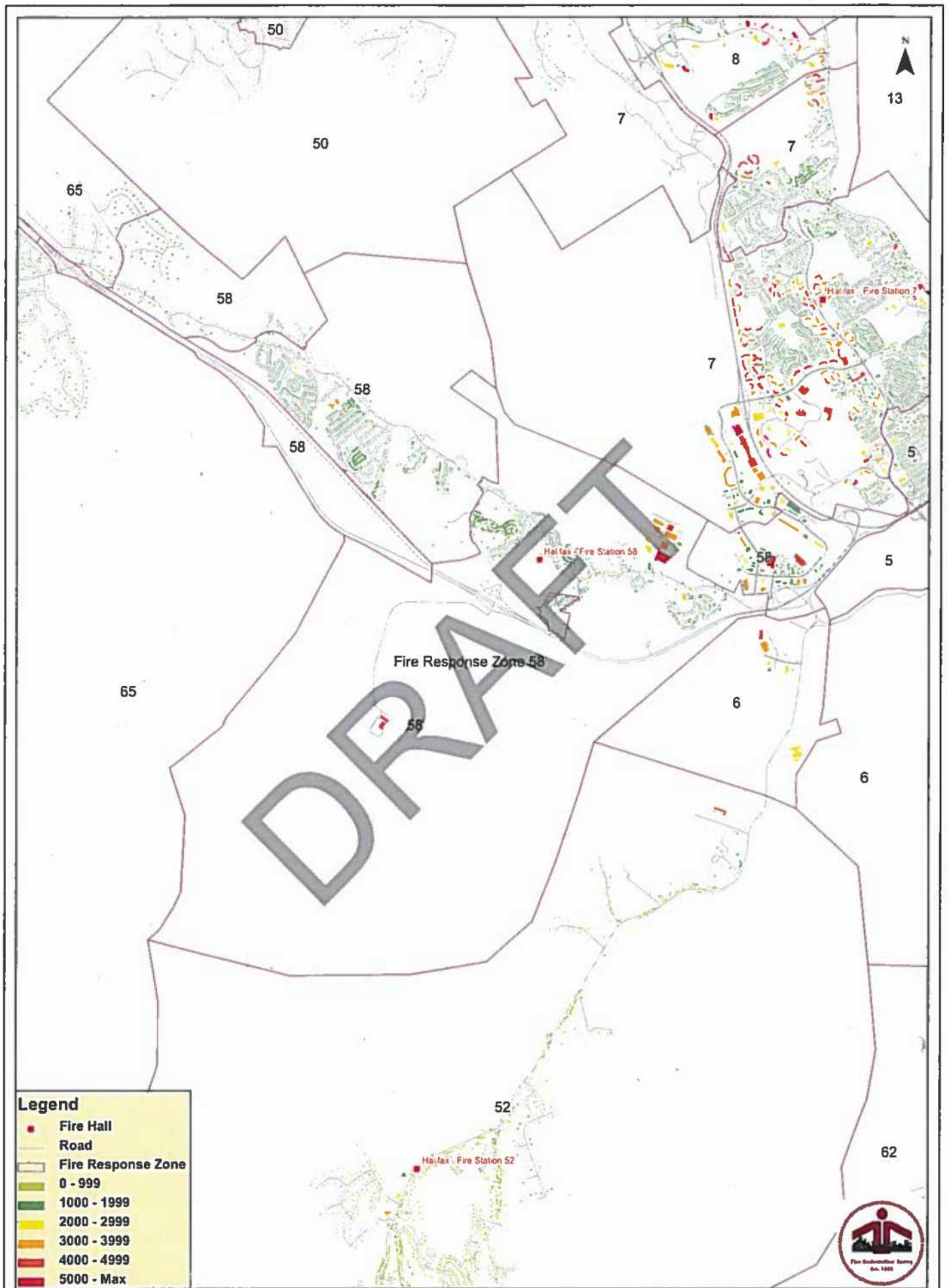


In addition the Basic Fire Flow was determined for the response area. The Basic Fire Flow is usually calculated as the 95th percentile RFF value or the 5th highest in the Fire Response Area. Considerations are given to the exposure risk, quantity of risks, and type of distribution. The 95 percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response Zone 58 is based on the 95th percentile which is 1,400 Imperial Gallons per Minute.

Table 2 Basic Fire Flows for HRM Response Zone 58

Total RFF Points	3,551	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,400	106.12
Max	9,700	735.26
5th highest	4,200	318.36





Apparatus & Personnel

Standard staffing for Station 58 is a 3 person 24/7 shift and a complement of 19 volunteers. Apparatus assignment for Station 58 is one Engine and one Pumper/Tanker. Station 58 was evaluated for the number of Engine and Ladder companies in service relative to the overall fire potential and the area being protected. Apparatus are required to be adequately housed and staffed. Fire apparatus that serve dual purposes are evaluated based on the primary duty it serves on the fire ground. The Total Credited Engine Companies is calculated by [REDACTED]

[REDACTED] The credit may be downgraded from 100 percent based on reliability factors such as age, quality, listing, pump test results and distance.

Based on the Basic Fire Flow of 1,400 IGPM, the apparatus requirements for Fire Station 58 as defined in the Fire Underwriters Survey - Table of Effective Response is as follows:

- First due Pumper Company in 3.5 minutes.
- Second due Pumper Company in 5 minutes.

The benchmark number of apparatus required is 2 Pumper companies in 5 minutes. These requirements reflect the apparatus need to attain maximum credit in the Engine and Ladder items of the fire department grading and serve as a benchmark against which response is measured. Ladders received 50 percent credit as Engine apparatus and 100 percent credit as Ladder apparatus. Fire Station 58 received credit for 2 Engines out of the maximum 2 Engine companies that can be credited for grading.

Table 3 Credited in Service Engine Summary

Station #	Vehicle Type	Apparatus Credit	Engine Credit	Reserve Engine Credit
58	Engine	100% Engine Credit	1	0
58	Pumper/Tanker	100% Engine Credit	1	0
	Engine	100% Reserve Credit	0	1
Total Engine Credit:			2	1
Maximum Credit Receivable (1,400 Igpm):			2	1

Response areas with five buildings that are 3 storeys or 10 m (35 ft) or more in height, or districts that have a Basic Fire Flow greater than 3,300 IGPM, or any combination of these criteria, should have a



Ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed Ladder companies for fire insurance grading to receive maximum credit. Currently there is no ladder stationed at Station 58. Based on the Basic Fire Flow and risk level, a Ladder is not required at Station 58.

Staffing at Station 58 was evaluated in its ability to meet the staffing requirements as determined by the Basic Fire Flow benchmark from the Table of Effective Response. The total available fire force grading item is weighted heavily within the fire insurance grading of the fire department. The staffing was measured against the FUS benchmark of at least six competent career fire fighters available and assigned to respond to fire for duty with each required Engine and Ladder Company. The number of first due (initial response) engine companies and ladder companies based on the benchmark Basic Fire Flow of 4,300 IGPM is two Engine companies and one Ladder. The maximum credit that Station 58 can receive for initial available fire force response is 18 fire fighters. NFPA 1710 requires each fire apparatus to be staffed with a minimum of four personnel. The current initial response from Station 58 is three fire fighters. The station was therefore credited with three fire fighters available for initial response out of the maximum 12 fire fighters that can be credited.

Station Location

Station 58 is well located for response. Figure 1 identifies the 2.5km, 5km and 8km coverage areas for Station 58. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.



Fire calls

The historical calls for Station 58 cover a large area of the HRM. Figure 3 shows the response of Station 58 based on its historical calls for the years 2010 to September 2013. Station 58 responded to an average of 298 calls in the 45 months reviewed. The following table is a breakdown of the calls from 2010 to 2013.

Table 4 Total Emergency calls per year

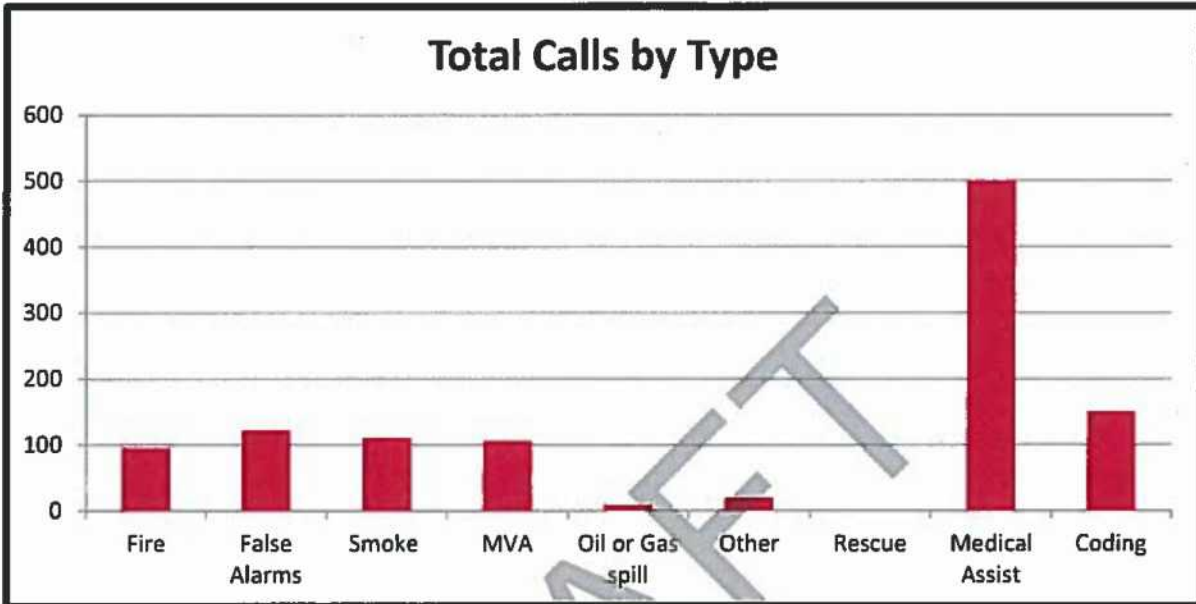
Total Calls per Year 2010 - 2013	
Year	No. of Calls
2010	257
2011	296
2012	332
2013	231

Table 5 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year Average	Percentage (%)
Fire	96	26	8.60
False alarm	122	33	10.93
Smoke	111	30	9.95
MVA	106	28	9.50
Oil or Gas spill	9	2	0.81
Other	20	5	1.79
Rescue	2	0.5	0.18
Med Assist	499	133	44.71
Coding	151	40	13.53



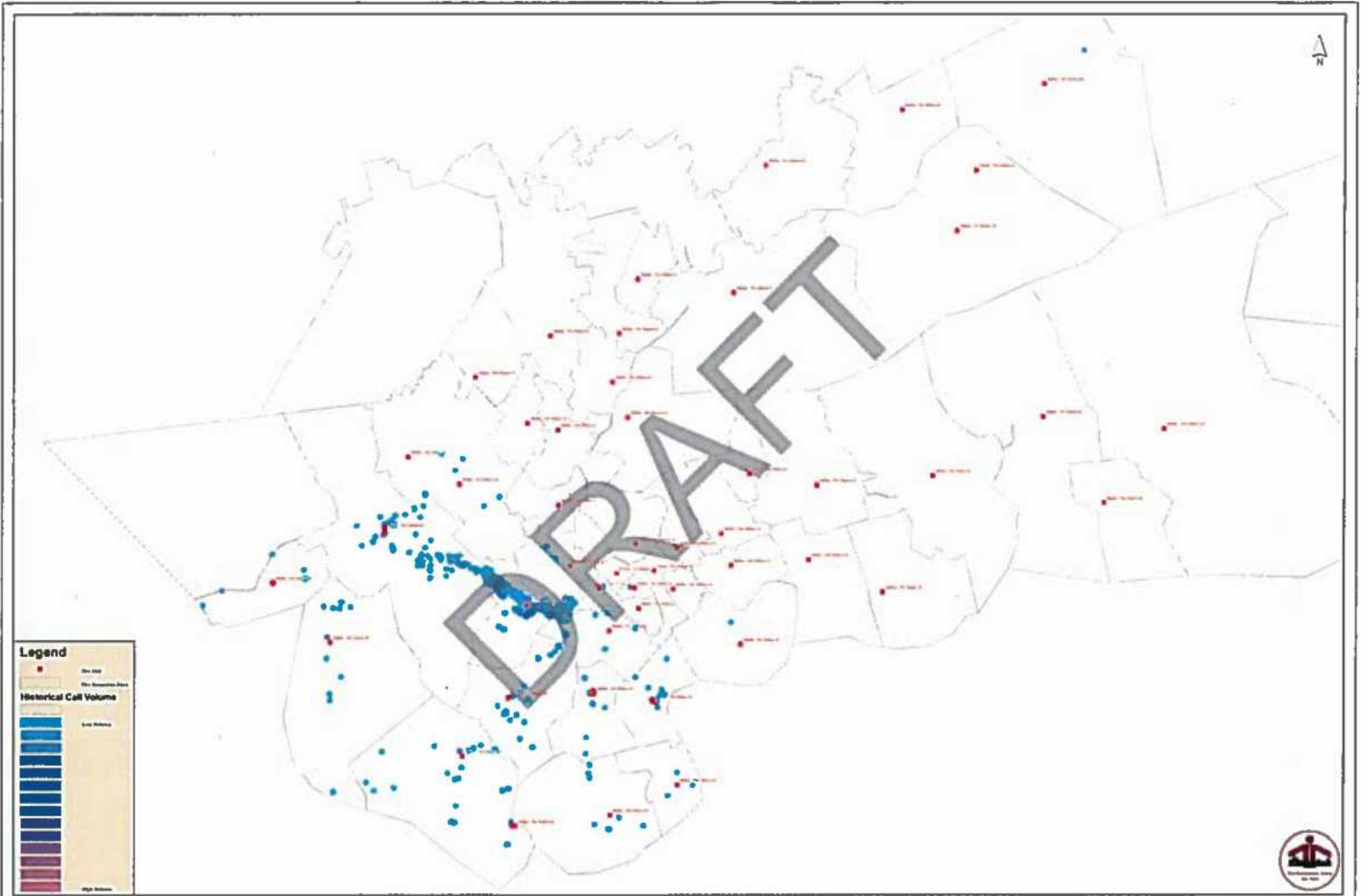
Figure 3 Emergency Calls by Incident Type (2010-2013)



The largest percentage of calls to Station 58 was medical assist calls. There were also several false alarm and motor vehicle accidents (MVA). Currently there is a fine applied to false alarms but it was found to be minimal. The resulting cost of time, apparatus and personnel responding to a fire alarm should be considered when determining applicable fines. The fines should be increased so as to deter false alarms and encourage building owners to maintain and repair fire alarm systems rather than pay a fine for a false alarm. For motor vehicle accidents, the fire department should submit their invoice for services provided as a result of an accident involving a motor vehicle or for a loss to a motor vehicle (i.e. fire) to the Province.

In reviewing the emergency call data it was noted that improvements need to be made in the call reporting procedure. HRM should implement a standard around the time stamping of fire calls and review each month for conformance with the standard and conformance with the "Service Delivery Standards for Halifax Regional Fire and Emergency" for all portions of the call listed in the service delivery standard.





Legend

- Fire Station
- Historical Call Volume

0-1000
1000-2000
2000-3000
3000-4000
4000-5000
5000-6000
6000-7000
7000-8000
8000-9000
9000-10000
10000-11000
11000-12000
12000-13000
13000-14000
14000-15000
15000-16000
16000-17000
17000-18000
18000-19000
19000-20000
20000-21000
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29000-30000
30000-31000
31000-32000
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35000-36000
36000-37000
37000-38000
38000-39000
39000-40000
40000-41000
41000-42000
42000-43000
43000-44000
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94000-95000
95000-96000
96000-97000
97000-98000
98000-99000
99000-100000

Figure 4 Historical Call Map - Fire Station 56

Scale = 1:100,000

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Within the HRM Relative Classifications for Emergency Communications, Fire Prevention and Safety Control were determined and applied as a single grade across the entire city.

Relative Classifications for Fire Department and Water Supplies were calculated specifically for individual areas as follows:

- Relative Classification for each Fire District i.e. the primary geographic response zone for each fire station (52 stations in 2013).
- Relative Classification for each Major Pressure Zone (SCADA zone) (17 zones in 2013).

The Fire Department Assessment contributes 40 percent to the total Public Fire Protection Classification grade. This is the most heavily weighted portion of the grading and as such is considered to be the most significant indicator of a community or municipality's overall preparedness for dealing with fire emergencies.

[REDACTED]

[REDACTED] This forms the basis of the relative classification of the Fire Department.



Figure 5 Fire Department Item Weights

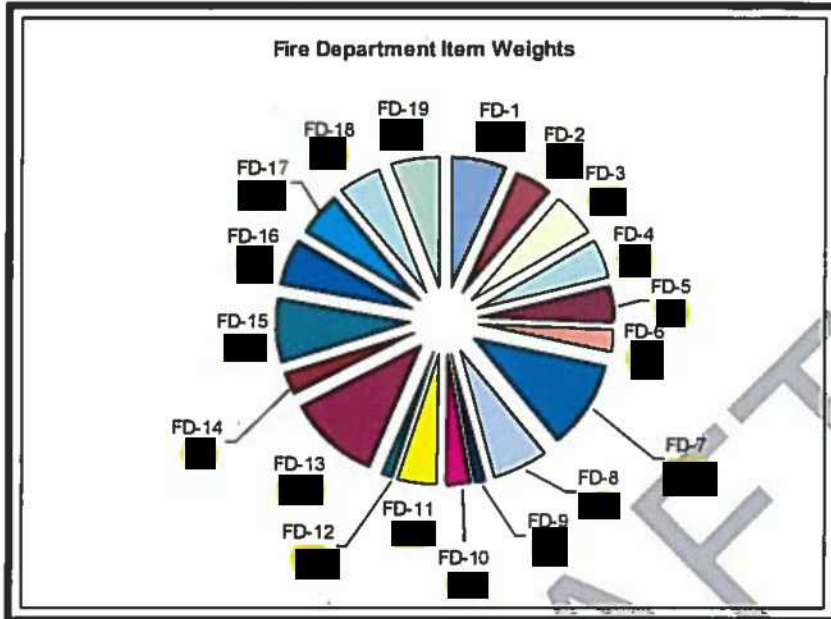


Figure 6 Fire Department Credit Points

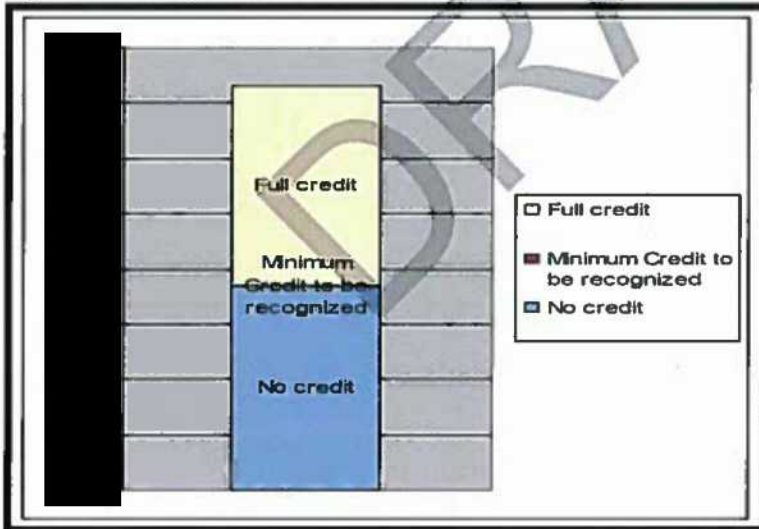
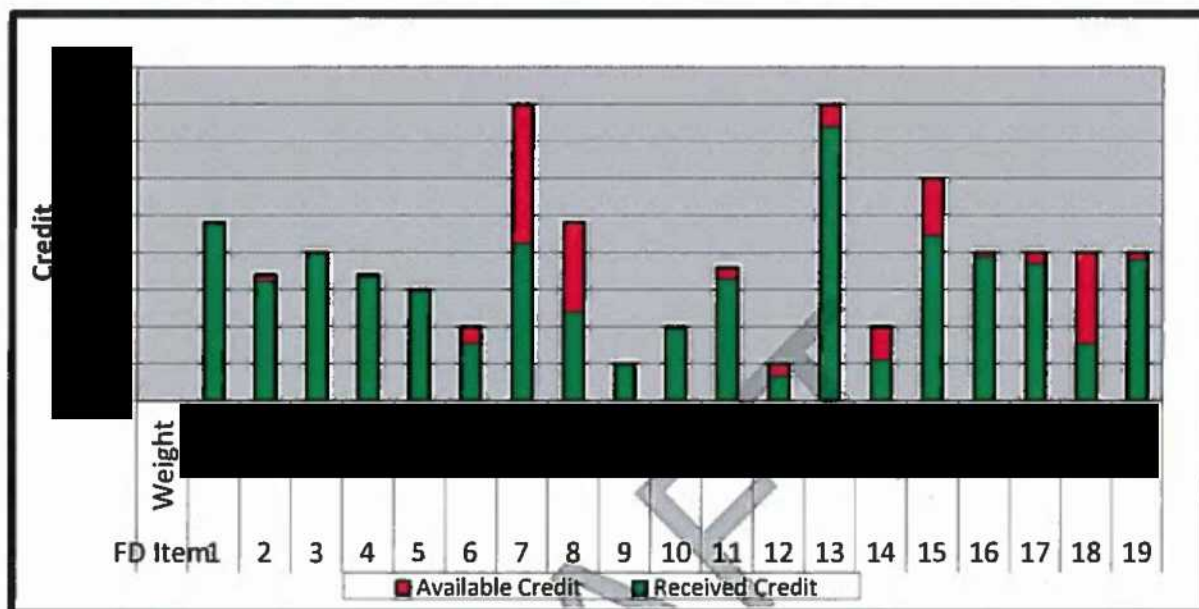


Table 6 Fire Department Grading Items Overall Summary

Grading Item	Category	Credit Received	Maximum Credit	% of FD	% of All
FD-1	Engine Service	240			
FD-2	Ladder Truck Service	161			
FD-3	Distribution of Companies and Type of Apparatus	200			
FD-4	Engine and Ladder Pump Capacity	168			
FD-5	Design, Maintenance and Condition of Apparatus	148			
FD-6	Number of Line Officers – Fire Suppression	78			
FD-7	Total Fire Force Available	212			
FD-8	Engine and Ladder Company Unit Manning	120			
FD-9	Master and Special Stream Devices	50			
FD-10	Equipment for Engines and Ladder Trucks, General	98			
FD-11	Fire Hose	165			
FD-12	Condition of Fire Hose	33			
FD-13	Training and Qualifications	369			
FD-14	Response to Alarms	55			
FD-15	Fire Ground Operations	223			
FD-16	Special Protection Required	194			
FD-17	Miscellaneous Factors and Conditions	185			
FD-18	Pre-Incident Planning	77			
FD-19	Administration	190			
Weight in Grading		40		Credit Received	24.77
Relative Classification					
4					



Figure 7 Fire Department Grading Items Overall Summary



Fire Station 58 was assigned a Relative Class of 4. The figure above shows each grading item of the fire department and how much credit was received and how much credit is still available within each grading item. The relative classification contributes to the overall Public Fire Protection Classification (PFPC) of Fire District 58 and that of the entire Halifax Regional Municipality. Factoring in the water supply, fire safety control and emergency grading items, Fire Station 58 was assigned an overall Public Fire Protection Classification of 4. This indicates that the level of response is proportionate to the level of risk in the fire protection district. To maintain the firefighting capabilities and the credit received for fire insurance grading purposes, it is recommended that a minimum of four career fire fighters be stationed at this fire hall.

Maintaining the Public Fire Protection Classification for Station 58 will ensure residents within the fire protection area receive the full benefit of available property insurance premium discounts based on the level of fire protection provided. In the event the Station 58 is downgraded from a PFPC 4 to PFPC 5 the resulting cost to the tax payer in the form of insurance premiums is approximately \$190,000.00 in insurance premium rate increases for the zone. These values are estimates only as insurance rates are dynamic and dependent on a large number of factors. A further point to consider is that as the PFPC



decreases in value, i.e. going from PFPC 5 to PFPC 4 the capacity of an insurer to underwrite in the City can change and in turn can create competition which can lower rates. It is difficult to quantify the true effects and figures given here are estimates.

Table 7 Premium Estimates under the Public Fire Protection Classification System – Response Zone 58

Public Fire Protection Classification	Total Premium Estimates Prior to FUS Study	Total Premium Estimates Post FUS Study	Total Premium Estimates Difference
4	\$2,363,768	\$2,363,768	
5			\$189,101

Recommendations

- Maintain four career fire fighters at Station 58.
- Standardize and equip communications rooms in each station with the requirements of NFPA 1221.



STATION 60

40 Latter Pond Lane, Herring Cove



Station 60 is located in the community of Herring Cove in the Halifax Regional Municipality. Figure 1 shows the current 2.5 km, 5 km and 8 km response coverage area for Station 60. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area (8 km coverage) represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is currently staffed by 18 volunteers and an E-Platoon of four career firefighters. The station houses one Engine, a Tanker and a Rescue unit.

Building and Tarmac

The station is constructed of concrete block with a metal clad (aluminum) roof. The two story station is approximately 7,500 square feet. It is equipped with a fire alarm system with heat and smoke detectors, and a fully operational security camera system. There are fire alarm pull stations by each exit.



The tarmac outside the station is a concrete covered area which extends from the bay door to the street and covers approximately 4,300 square feet. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

Facilities

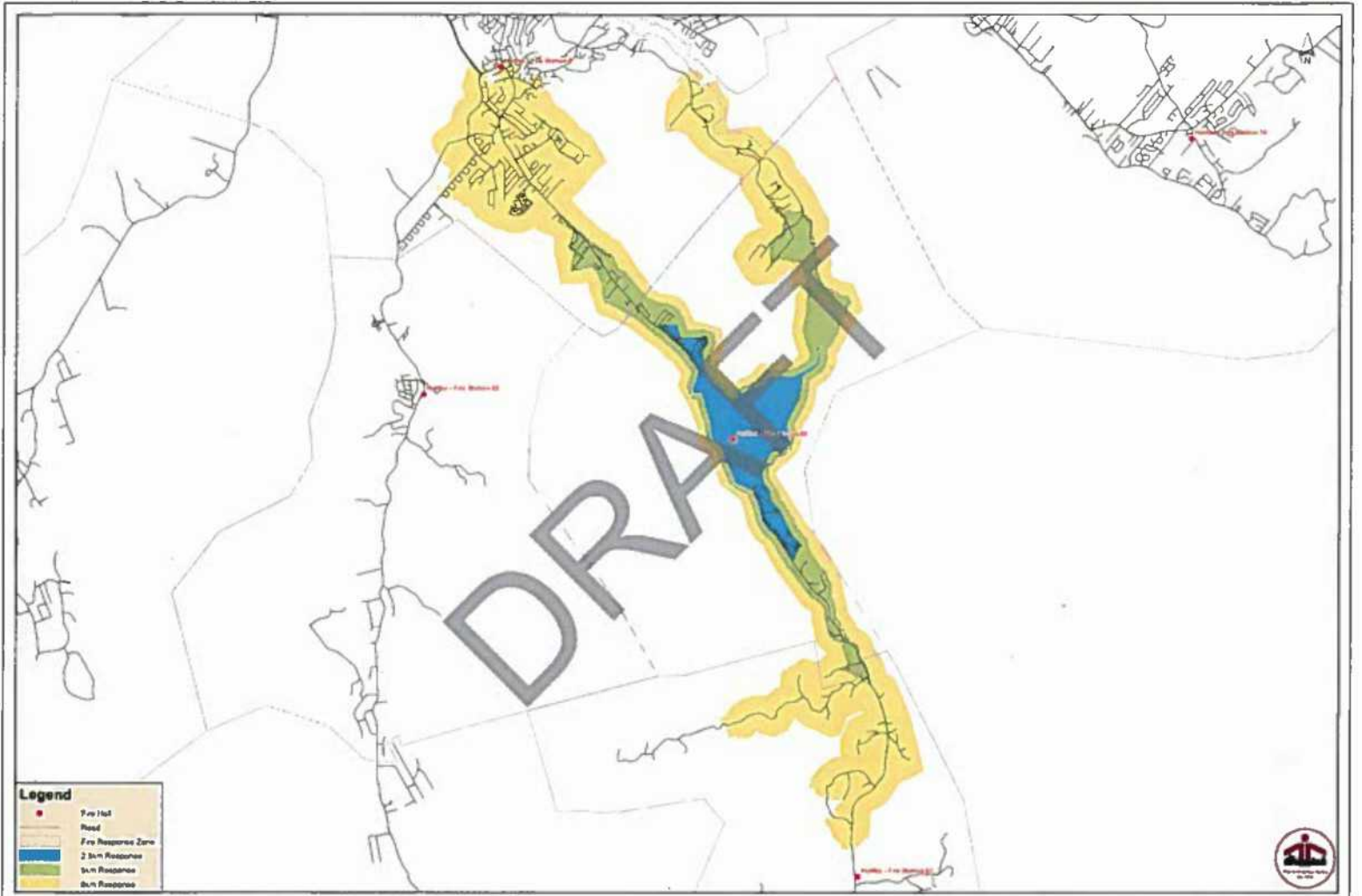
Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The station is new and has modern facilities which were found to be in overall good condition. There is sufficient room for future growth in the station.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

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Legend

- Fire Station
- Road
- Fire Response Zone
- 2 km Response
- 5 km Response
- 5km Response

Figure 1 - 2.55/5km Response from Fire Station 60

Scale = 1:10,000

Community Risk Profile – Response Zone 60

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 1,126 Required Fire Flows were calculated for Response Zone 60 as shown in Figure 2. The Basic Fire Flows assigned for Station 60 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile or the 5th highest RFF in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 90th or 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited to large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for this zone is based on the 90th Percentile Required Fire Flow value which is 1,400 IGPM.

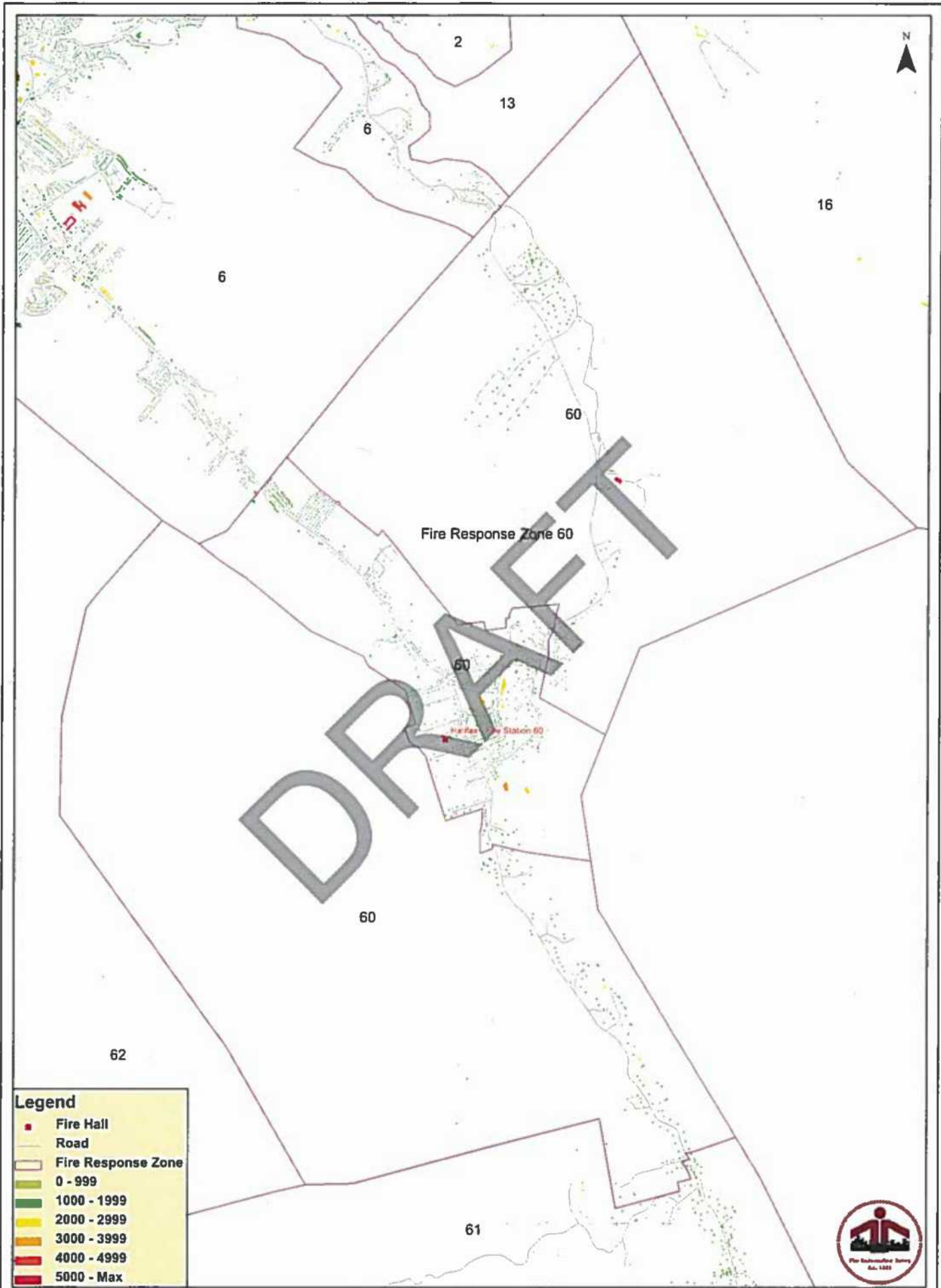
Table 1 Required Fire Flow ranges in Response Zone 60

RFF Range	No. of RFF points
0-999 IGPM	239
1,000-1,999 IGPM	876
2,000-2,999 IGPM	9
3,000-3,999 IGPM	1
4,000-4,999 IGPM	0
>=5,000 IGPM	1

Table 2 Basic Fire Flows for HRM Response Zone 60

Total RFF Points	1,126	
	IGPM	l/s
90th Percentile	1,400	106.12
95th Percentile	1,600	121.28
Max	5,100	386.58
5th highest	2,600	197.08





Apparatus and Personnel

Based on the Basic Fire Flow of 1,400 IGPM, the benchmark number of apparatus required for Fire Station 60 is one Engine apparatus. Station 60 is equipped with one Engine. Standard staffing for Station 60 is 18 volunteers, and an E-Platoon of four career firefighters which meets the first response requirements for the level of risk in the fire protection area.

Fire Calls

In the period from January 2010 until September 2013 Station 60 received 242 emergency calls with a breakdown by call type as shown in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls that could not be identified.

The majority of calls to this station were Medical calls at 48.8% of the total call volume.

Table 3 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year-Average	Percentage (%)
Fire	25	7	10.33
False alarm	47	13	19.42
Smoke	18	5	7.44
Motor Vehicle Accident	10	3	4.13
Oil or Gas spill	1	0	0.41
Other	3	1	1.24
Rescue	1	0	0.41
Medical Assist	118	31	48.76
Coding	19	5	7.86



Figure 3 Emergency Calls by Incident Type (2010-2013)

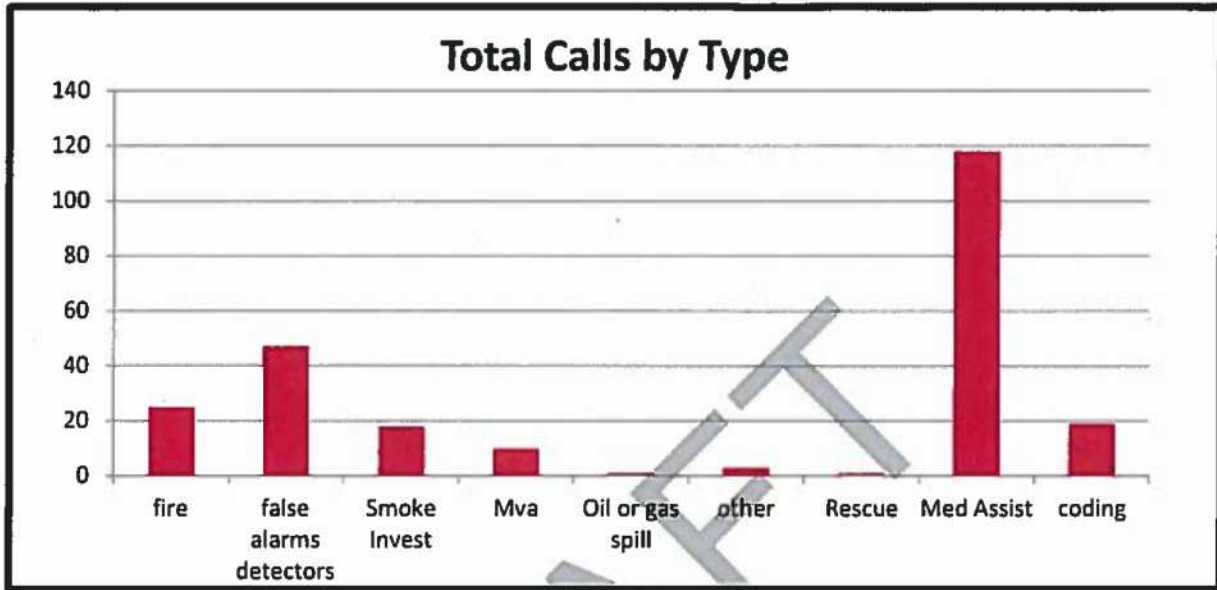


Figure 4 Percentage of Calls by Incident Type (2010-2013)

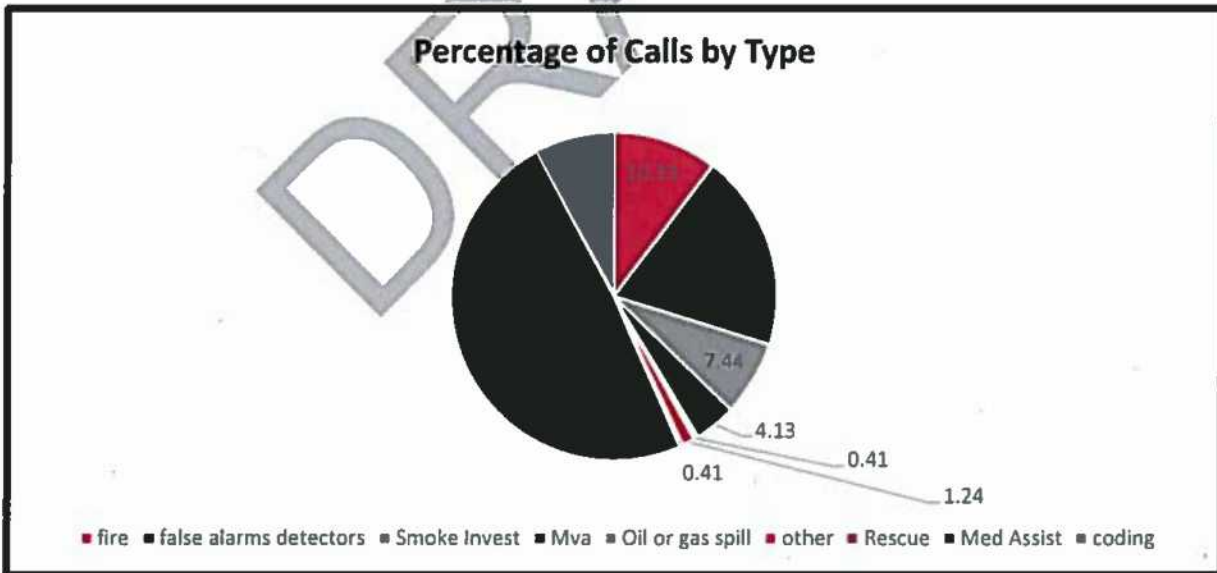


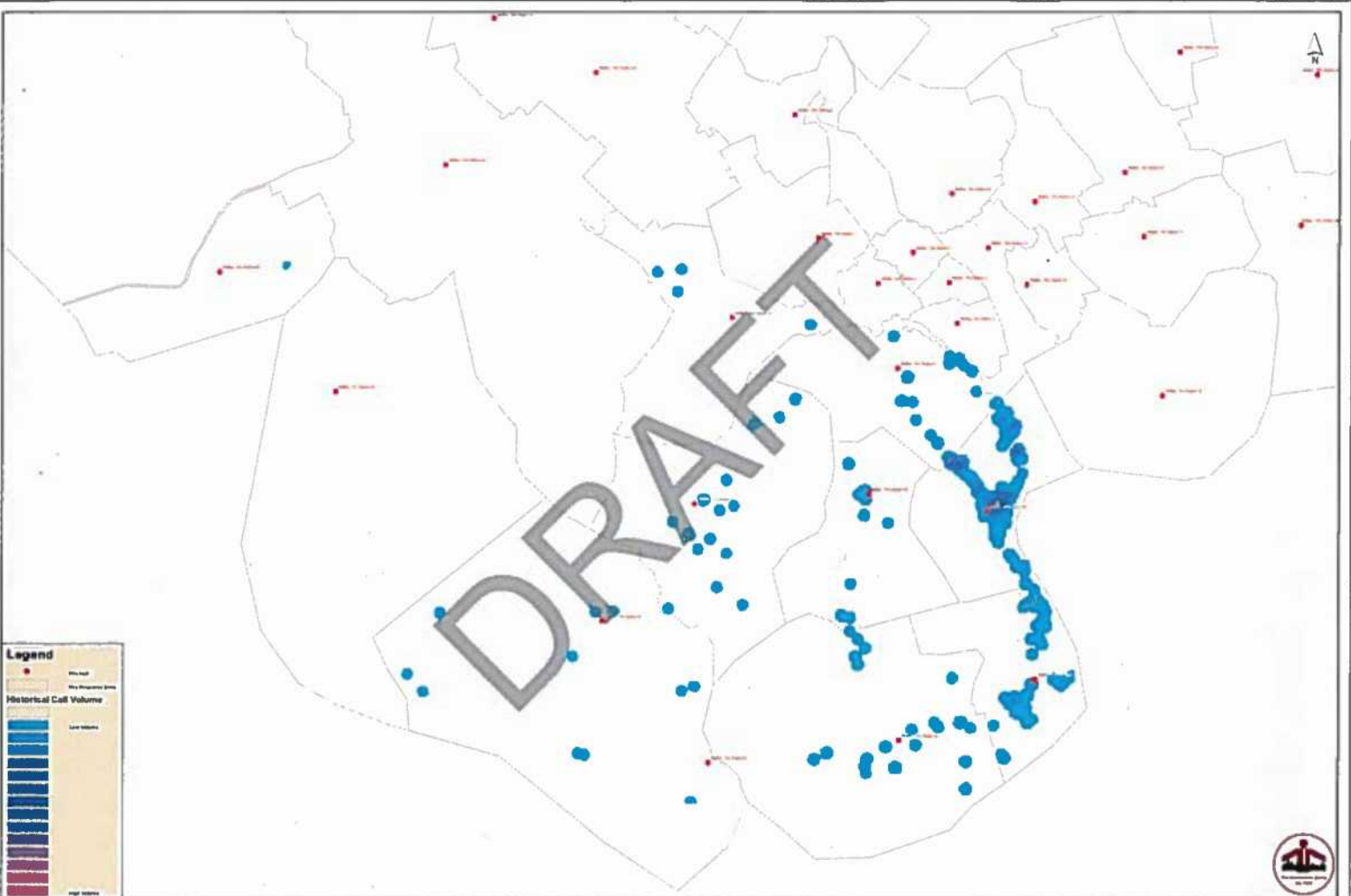
Table 4 is a breakdown of the fire calls by time of day for Station 60. The total number of calls in Table 4 does not include calls whereby the apparatus returned to the station or those for which the type of call could not be identified. The bulk of the calls are evening responses in this area.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	20	8.8%
Daytime	0700 – 1659	50	21.9%
Evening	1700 – 2359	158	69.3%

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Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 60 was assigned a Public Fire Protection Classification of 8 and Dwelling Protection Grade 3B.

Recommendations

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



STATION 62
1070 Old Sambro Road



Station 62 is located in the community of Harrietsfield in the Halifax Regional Municipality. Figure 1 shows the current 2.5 km, 5 km and 8 km response coverage area for Station 62. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area is the 8km coverage and represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is currently staffed by 8 volunteer firefighters and houses one Engine, a Tanker and a Rescue unit. The volunteer staffing at this station is shared with Station 63 and response is provided by the station closest to the incident.

Building and Tarmac

The station is constructed of concrete block with an aluminum exterior siding and combustible interior. The roof construction is aluminum. The one story station is approximately 3,800 square feet. The tarmac outside the station is an asphalt covered area which extends from the bay door to the street and covers



approximately 2,200 square feet. The tarmac was found to be in poor condition with several cracks and sinking in some areas.

Facilities

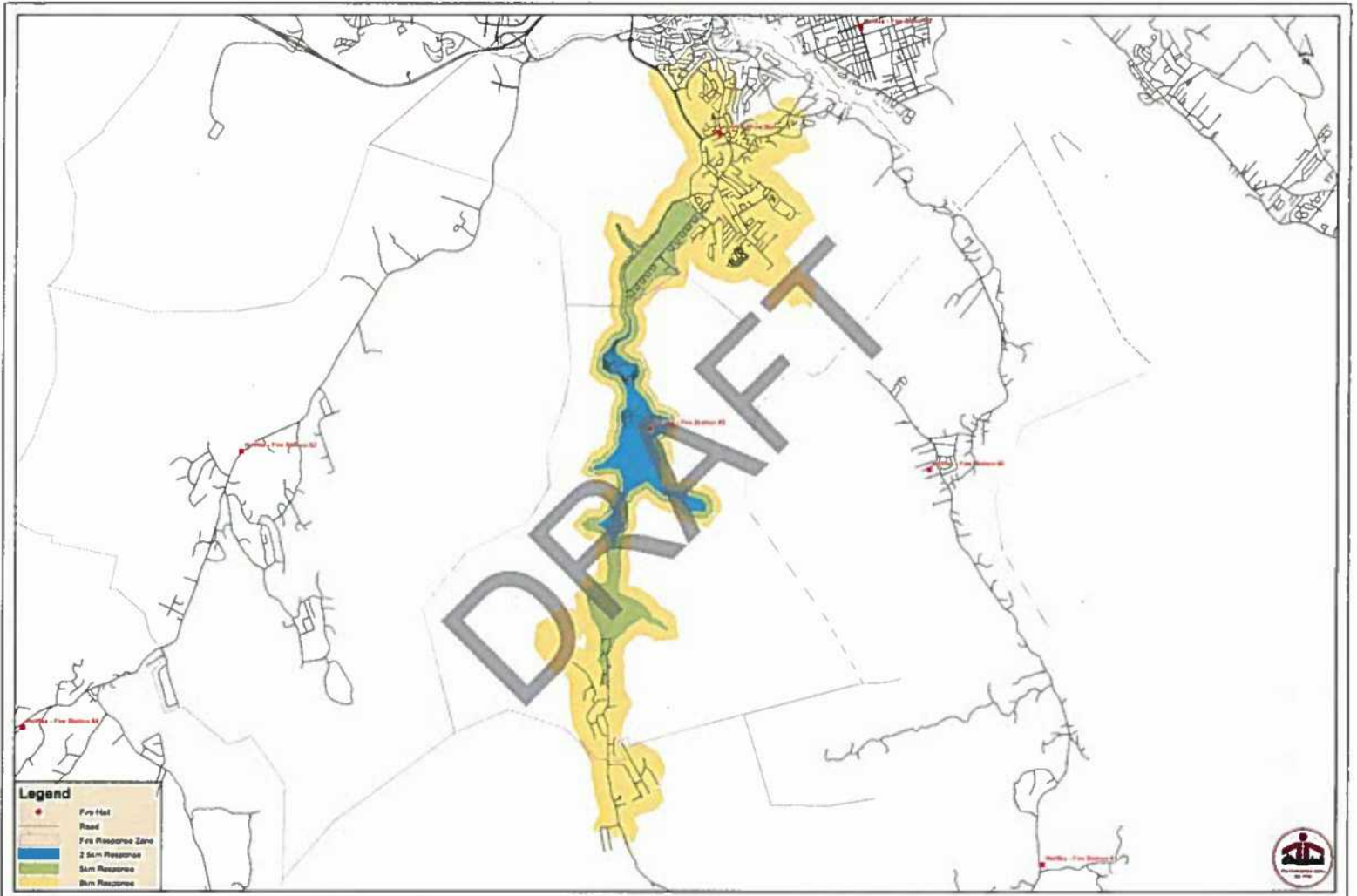
Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. Overall the station was found to be in fair condition.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.

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Community Risk Profile – Response Zone 62

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community’s fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 891 Required Fire Flows were calculated for Response Zone 62 as shown in Figure 2. The Basic Fire Flows assigned for Station 62 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for this zone is based on the 95th Percentile Required Fire Flow value which is 1,400 IGPM.

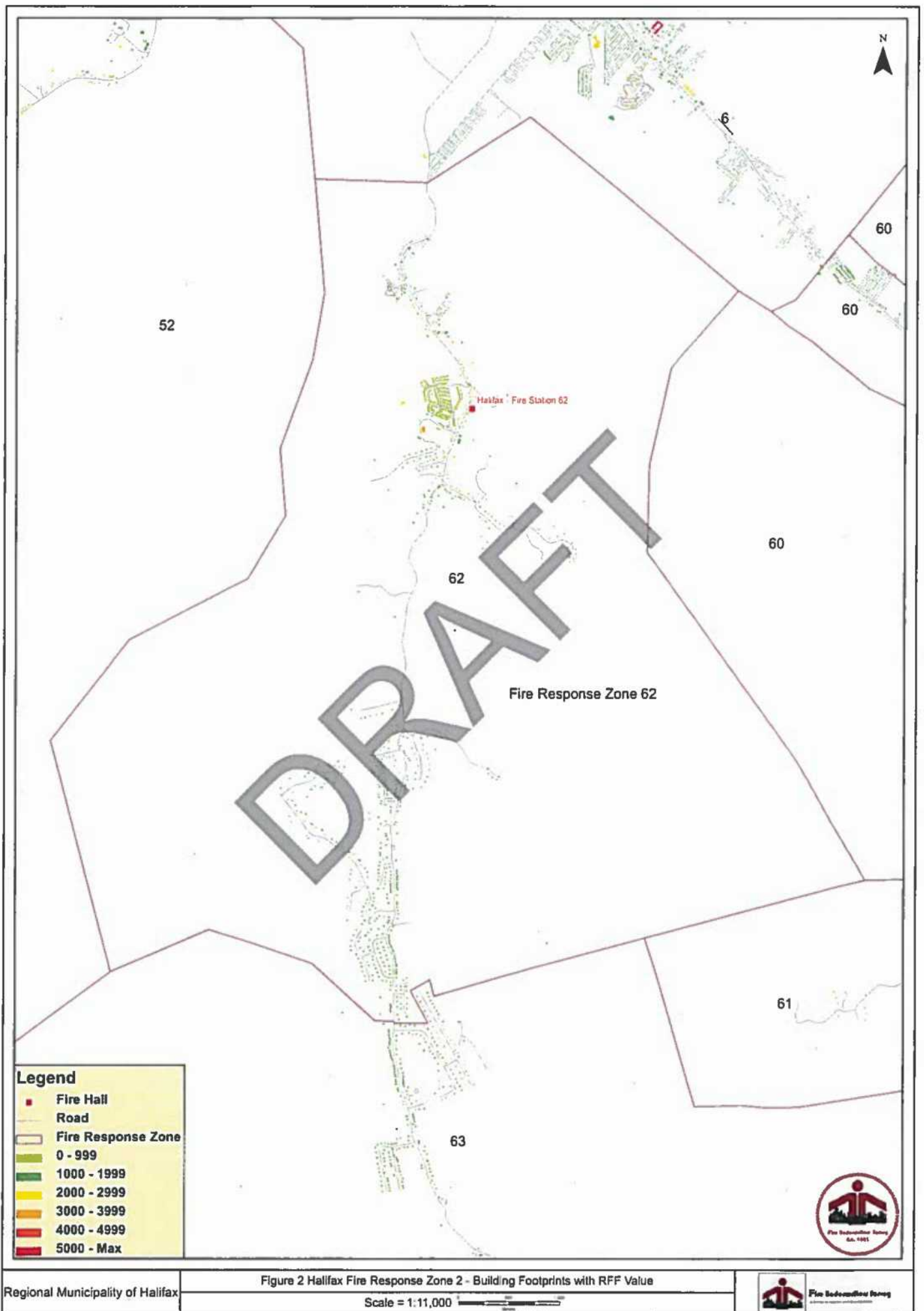
Table 1 Required Fire Flow ranges in Response Zone 62

RFF Range	No. of RFF points
0-999 IGPM	338
1,000-1,999 IGPM	545
2,000-2,999 IGPM	7
3,000-3,999 IGPM	1
4,000-4,999 IGPM	0
>=5,000 IGPM	0

Table 2 Basic Fire Flows for HRM Response Zone 62

Total RFF Points	891	
	IGPM	L/s
90th Percentile	1,200	90.96
95th Percentile	1,400	106.12
Max	3,000	227.40
5th highest	2,200	166.76





Apparatus and Personnel

Based on the Basic Fire Flow of 1,400 IGPM, the benchmark number of apparatus required for Fire Station 62 is one Engine apparatus. Station 62 is equipped with one Engine. Standard staffing for Station 62 is 8 volunteers although the 10 volunteers at Station 63 are assigned and available to respond to Station 63. This meets the minimum of 15 volunteers required on a fire department roster to provide adequate response. However since the volunteers are not exclusively assigned to Station 62 the response is not recognized for fire insurance grading purposes.

Fire Calls

In the period from January 2010 until September 2013 Station 62, received 312 emergency calls with the following breakdown as shown in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or where the types of calls could not be identified.

The primary response for this station has been Medical calls at 37% of the total call volume.

Table 3 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year Average	Percentage (%)
Fire	41	11	13.14
False alarm	32	9	10.26
Smoke	16	4	5.13
Motor Vehicle Accident	36	10	11.54
Oil or Gas spill	1	0	0.32
Other	4	1	1.28
Rescue	0	0	0.00
Medical Assist	116	31	37.18
Coding	66	18	21.25



Figure 3 Emergency Calls by Incident Type (2010-2013)

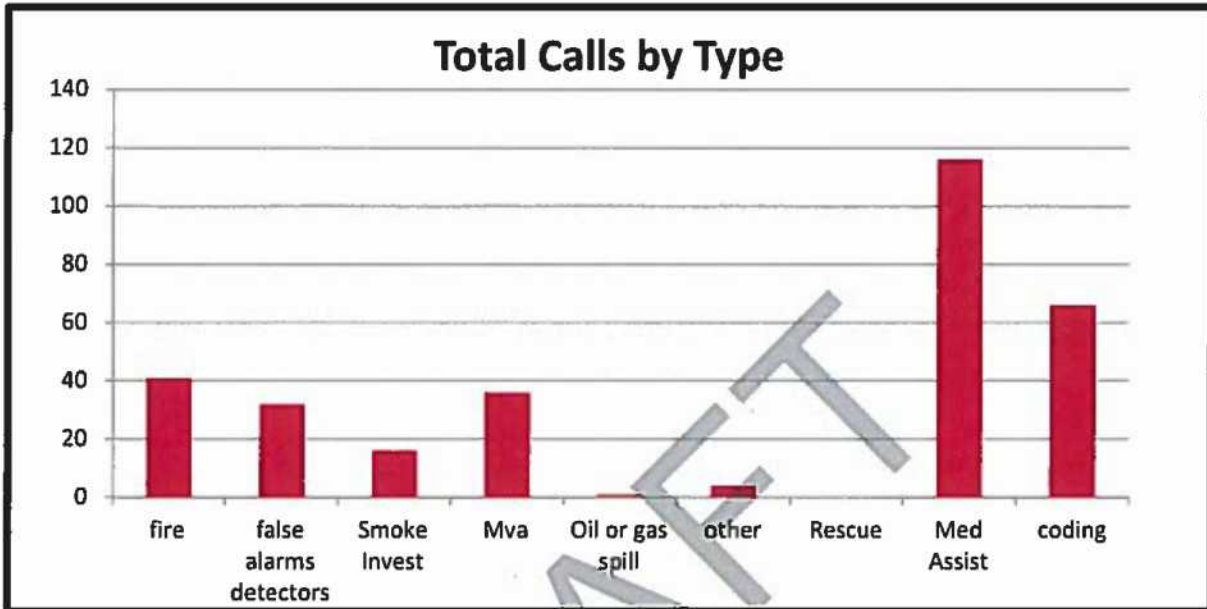


Figure 4 Percentage of Calls by Incident Type (2010-2013)

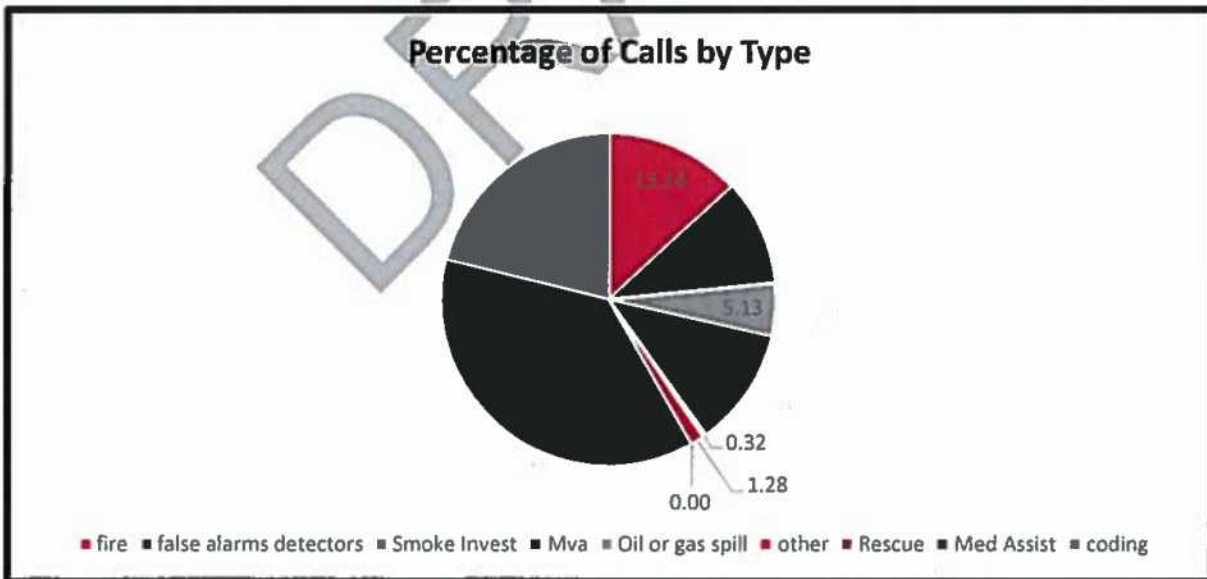


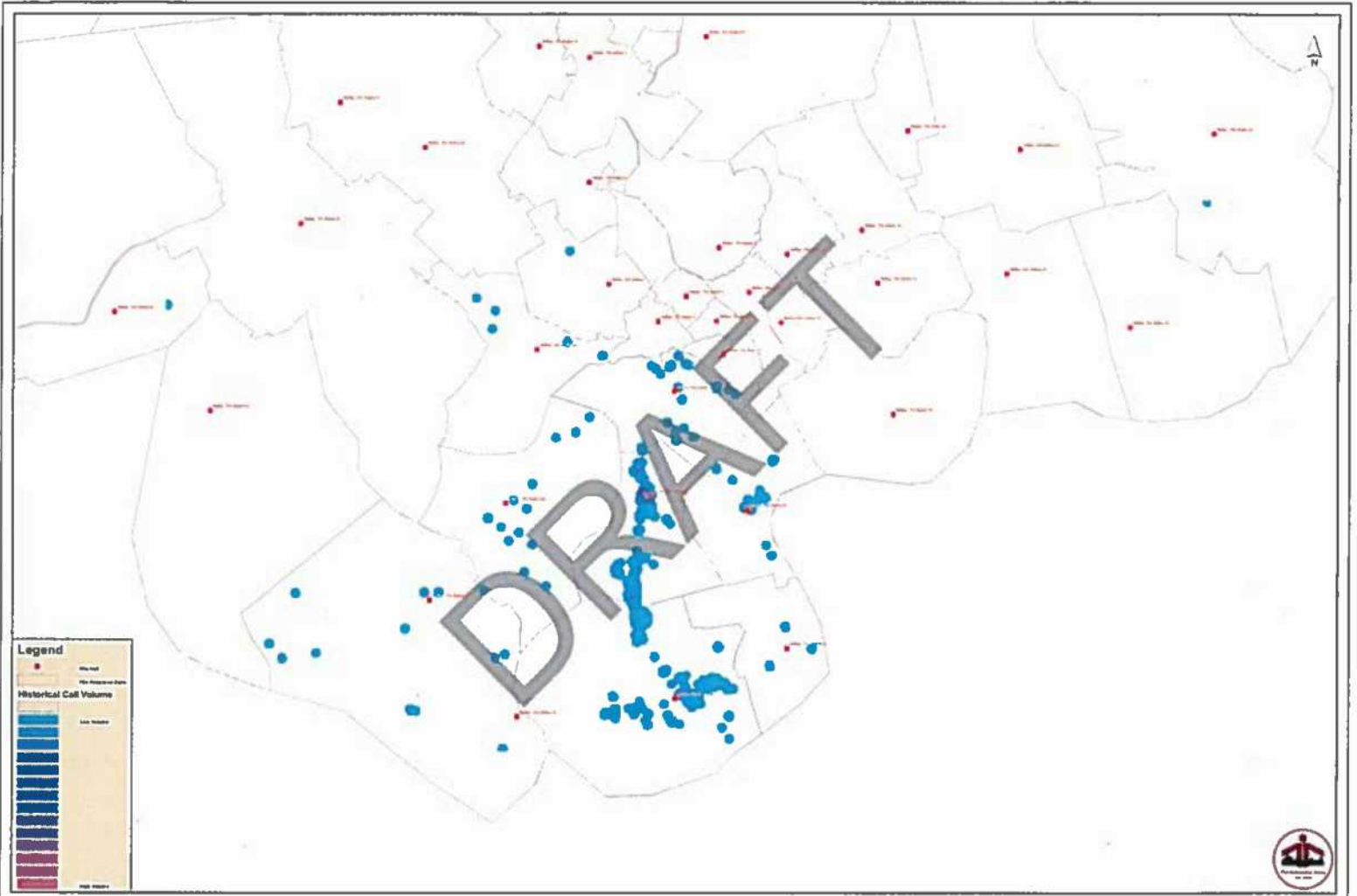
Table 4 is a breakdown of the fire calls by time of day for Station 62. The bulk of the calls are daytime and evening responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	37	11.9%
Daytime	0700 – 1659	157	50.3%
Evening	1700 – 2359	118	37.8%

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Legend

- Fire Station
- Historical Call Volume

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 62 was assigned a Public Fire Protection Classification of 10 and Dwelling Protection Grade 5.

Recommendations

- Close Station 62 and 63 and replace the two fire halls with a single centralized station.
- The E-Platoon from Station 63 should be assigned to the new station and supported by the present core of volunteers.



STATION 63

160 West Pennant Road, Sambro



Station 63 is located in the rural community of Sambro in the HRM, off of West Pennant Road. Figure 1 shows the current 2.5 km, 5 km and 8 km response coverage area for Station 63. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows for fire insurance grading. The green area (5 km coverage) represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area (8 km coverage) represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is staffed by 10 volunteer fire fighters and an E-platoon. The volunteer staffing at this station is shared with Station 62 (for a total of 18 volunteers) and response is provided by the station closest to the incident. Station 63 houses an Engine and a Tanker.



Building and Tarmac

The station building is of non-combustible construction and aluminum siding with an asphalt shingle roof. The station is one story with a mezzanine and is approximately 2,000 square feet. There are two apparatus bays. The station can adequately house the apparatus assigned to it.

The tarmac outside the station is an asphalt covered area which extends from the bay door to the street and covers approximately 1,700 square feet. The tarmac provides sufficient room to pull all of the apparatus out of the hall completely for daily inspections and run up routines.

Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. The facilities in Station 63 are minimal and inadequate to meet the needs of the fire fighters.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.



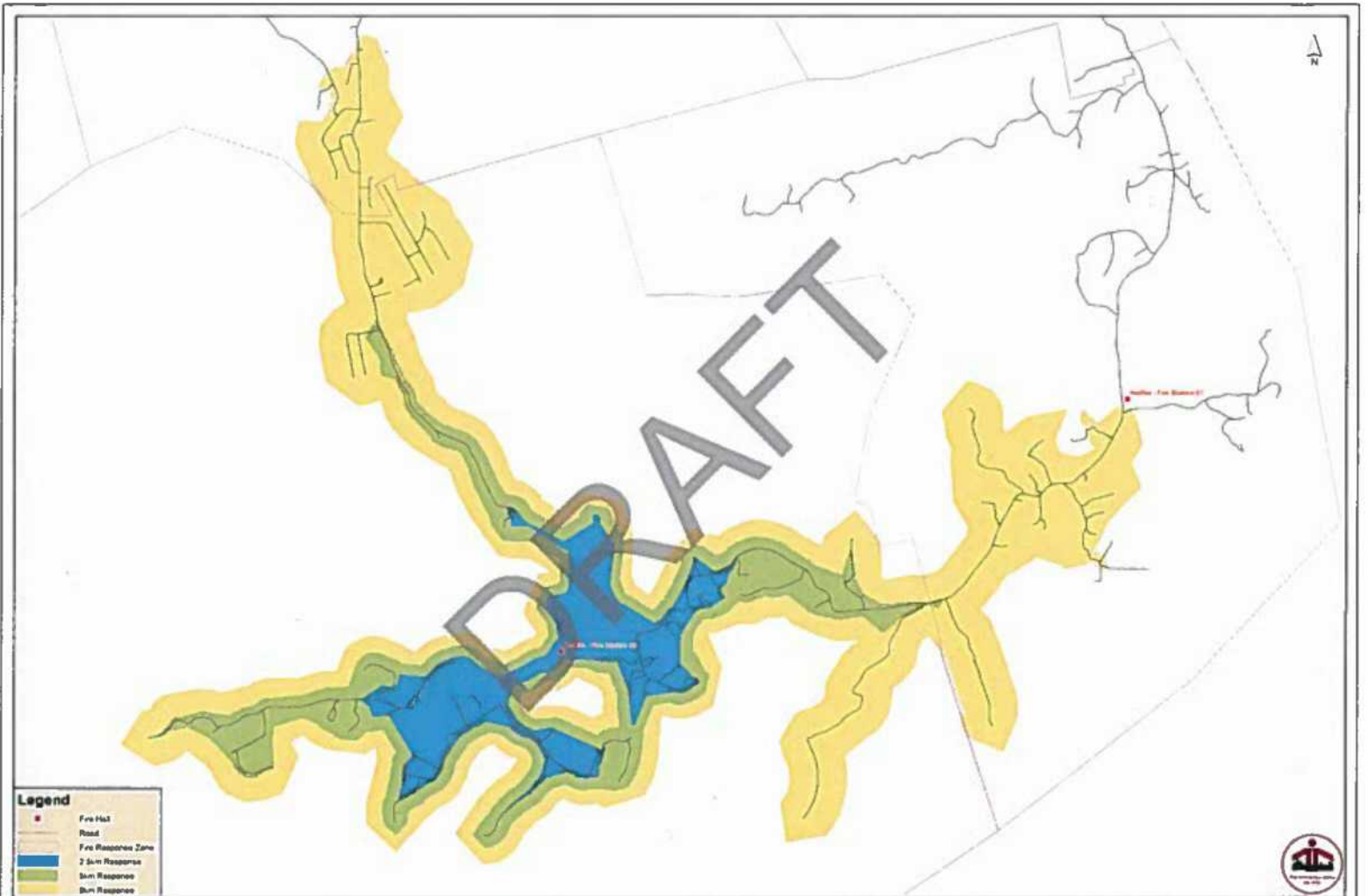


Figure 1.2 5km/8km Response from Fire Station 63

Scale = 1:12,000

Community Risk Profile – Response Zone 63

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 967 Required Fire Flows were calculated for Response Zone 63 as shown in Figure 2 below.

Table 1 Required Fire Flow ranges in Response Zone 63

RFF Range	No. of RFF points
0-999 IGPM	254
1,000-1,999 IGPM	708
2,000-2,999 IGPM	5
3,000-3,999 IGPM	0
4,000-4,999 IGPM	0
>=5,000 IGPM	0



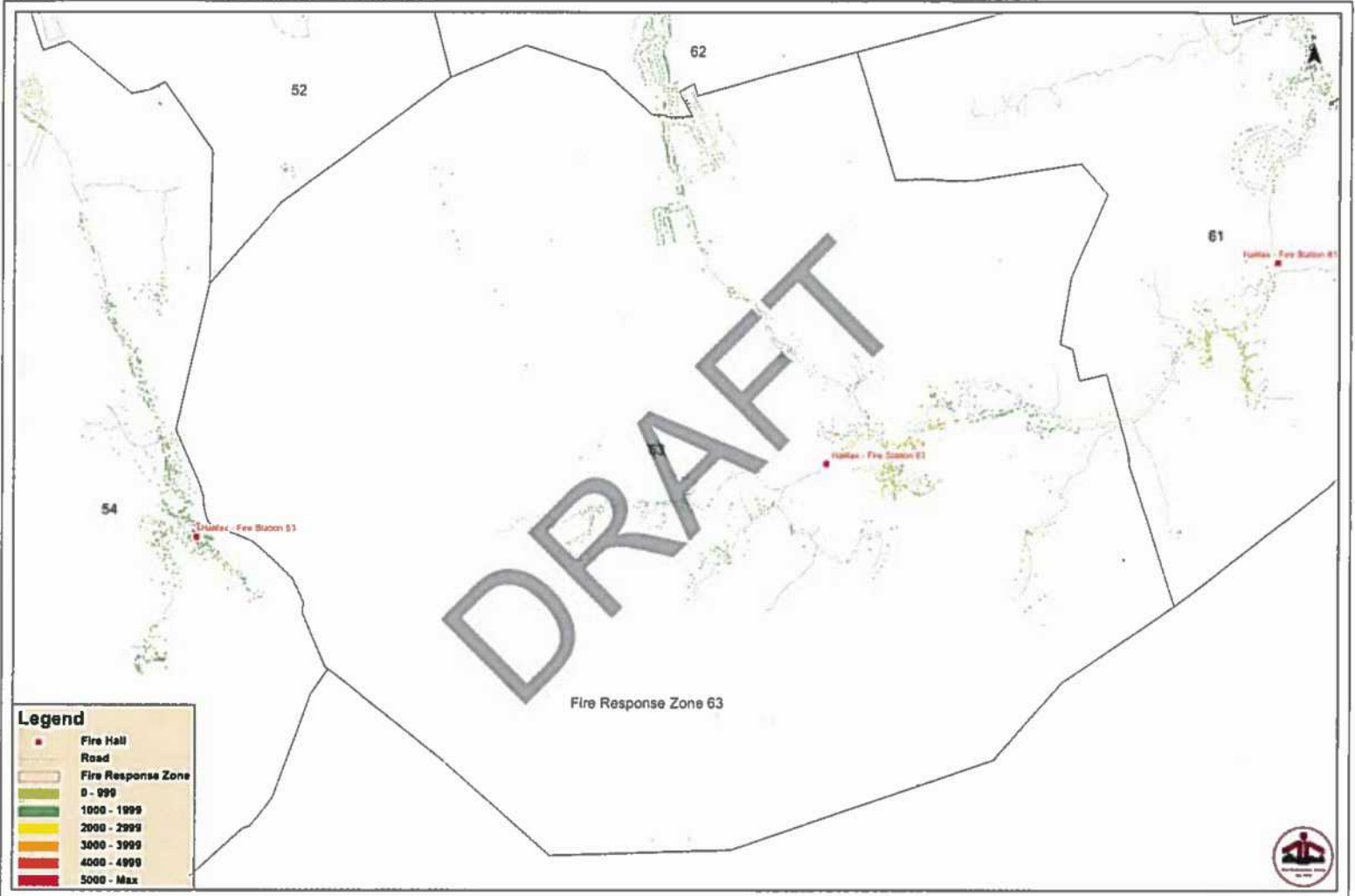


Figure 2 Halifax Fire Response Zone 63 - Building Footprints with RFF Value

The Basic Fire Flows assigned for Station 63 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited to large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for Response zone 63 is based on the 95th percentile which is 1,200 imperial gallons per minute.

Table 2 Basic Fire Flows for HRM Response Zone 63

Total RFF Points	967	
	IGPM	l/s
90th Percentile	1,200	90.96
95th Percentile	1,200	90.96
Max	2,400	181.92
5th highest	2,000	151.60

Apparatus and Personnel

Based on the Basic Fire Flow of 1,200 IGPM, the benchmark number of apparatus required for Fire Station 63 is one Engine apparatus. Station 63 is equipped with one Engine. Standard staffing for Station 63 is 10 volunteers and an E-platoon, although the 8 volunteers at Station 62 are assigned and available to respond to Station 63.

Fire Calls

In the period from January 2010 until September 2013 Station 63 received a total of 238 emergency calls with the following breakdown as described in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or those for which the types of calls could not be identified. The year average was calculated for all calls over the 45 months reviewed.

The primary response for this station has been Medical calls at 47.5% of the total call volume.



Table 3 Emergency calls by Incident Type

Call by type			
Type	Total	Year Average	Percentage (%)
Fire	43	11	18.07
False alarm	21	6	8.82
Smoke	21	6	8.82
Motor Vehicle Accident	23	6	9.66
Oil or Gas spill	1	0	0.43
Other	3	1	1.26
Rescue	4	1	1.68
Med Assist	113	30	47.48
Coding	9	2	3.78

Figure 3 Emergency Calls by Incident Type (2010-2013)

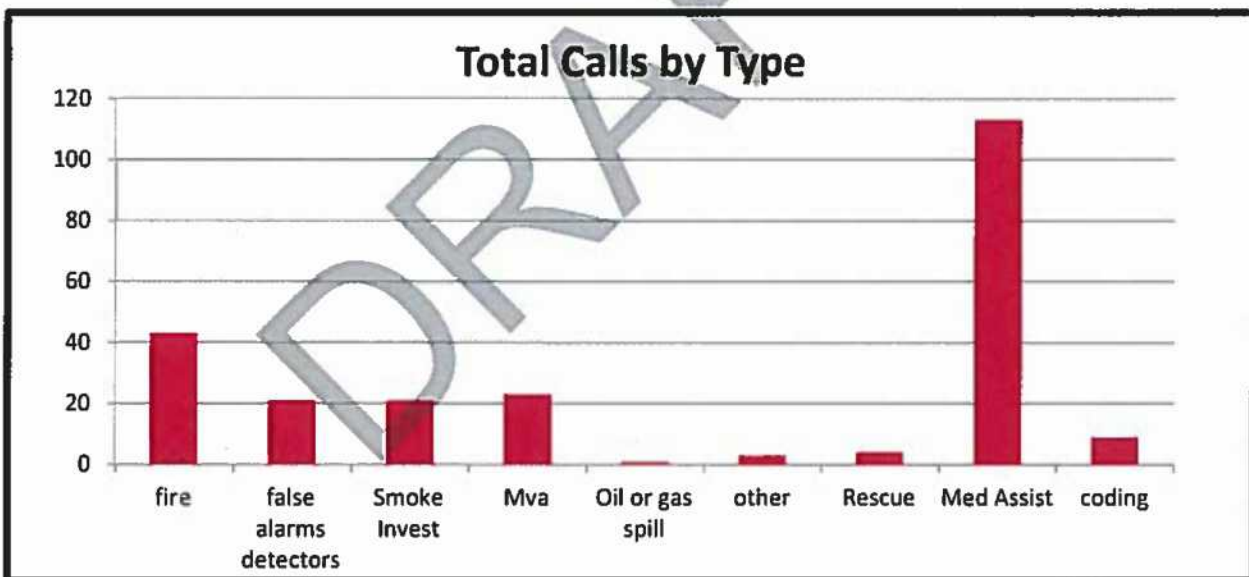


Figure 4 Percentage of Calls by Incident Type (2010-2013)

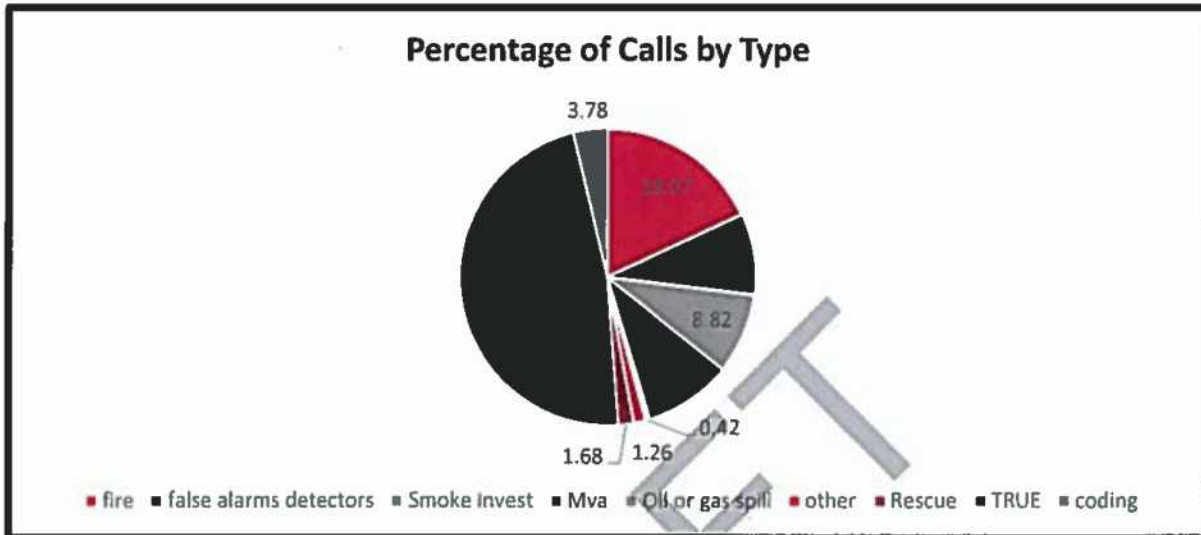


Table 4 is a breakdown of the fire calls by time of day for Station 63. The bulk of the calls are daytime and evening responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	0000 – 0659	23	9.7%
Daytime	0700 – 1659	129	54.2%
Evening	1700 – 2359	86	36.1%



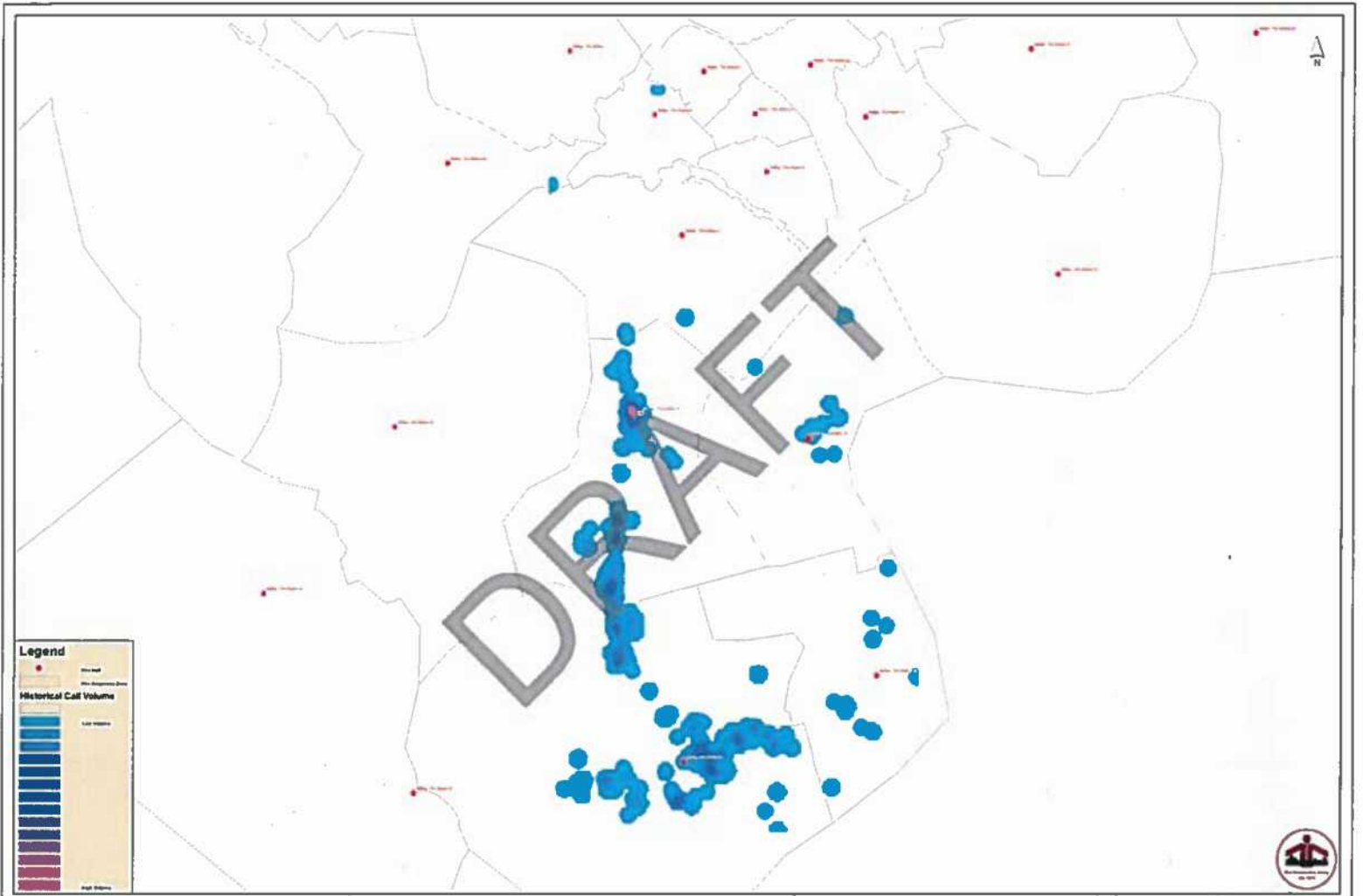


Figure 5 Historical Call Map - Fire Station 63

Scale = 1:35,000

Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 63 was assigned a Public Fire Protection Classification of 8 and Dwelling Protection Grade 3B.

Recommendations

- Close Station 62 and 63 and replace the two fire halls with a single centralized station.
- The E-Platoon from Station 63 should be assigned the new station and supported by the present core of volunteers.



STATION 65

17 Scholars Road, Upper Tantallon



Station 65 is located in the community of Upper Tantallon in the Halifax Regional Municipality. Figure 1 shows the current 2.5km, 5km and 8km response coverage area for Station 65. The blue area is the 2.5 km response zone which represents the ideal coverage for buildings with high Required Fire Flows. The green area represents the recognized first response coverage for commercial risks; beyond the 5 km, commercial risks are considered unprotected for fire insurance grading purposes. The yellow area represents the recognized first response coverage for residential risks. Residential coverage generally includes single family buildings and multi-family buildings of four units or less.

The station is currently staffed by 27 volunteers and houses one Engine, a Tanker, a Brush fire unit, and a Tactical Support unit. In addition, an E-Platoon of four personnel complements the daytime response at this station.



Building and Tarmac

The station is constructed of concrete block and steel truss with an aluminum roof. The two story station is approximately 7,500 square feet. It is equipped with a fire alarm system with heat and smoke detectors and a fully operational security camera system. The tarmac outside the station is a concrete covered area which extends from the bay door to the street and covers approximately 4,300 square feet.

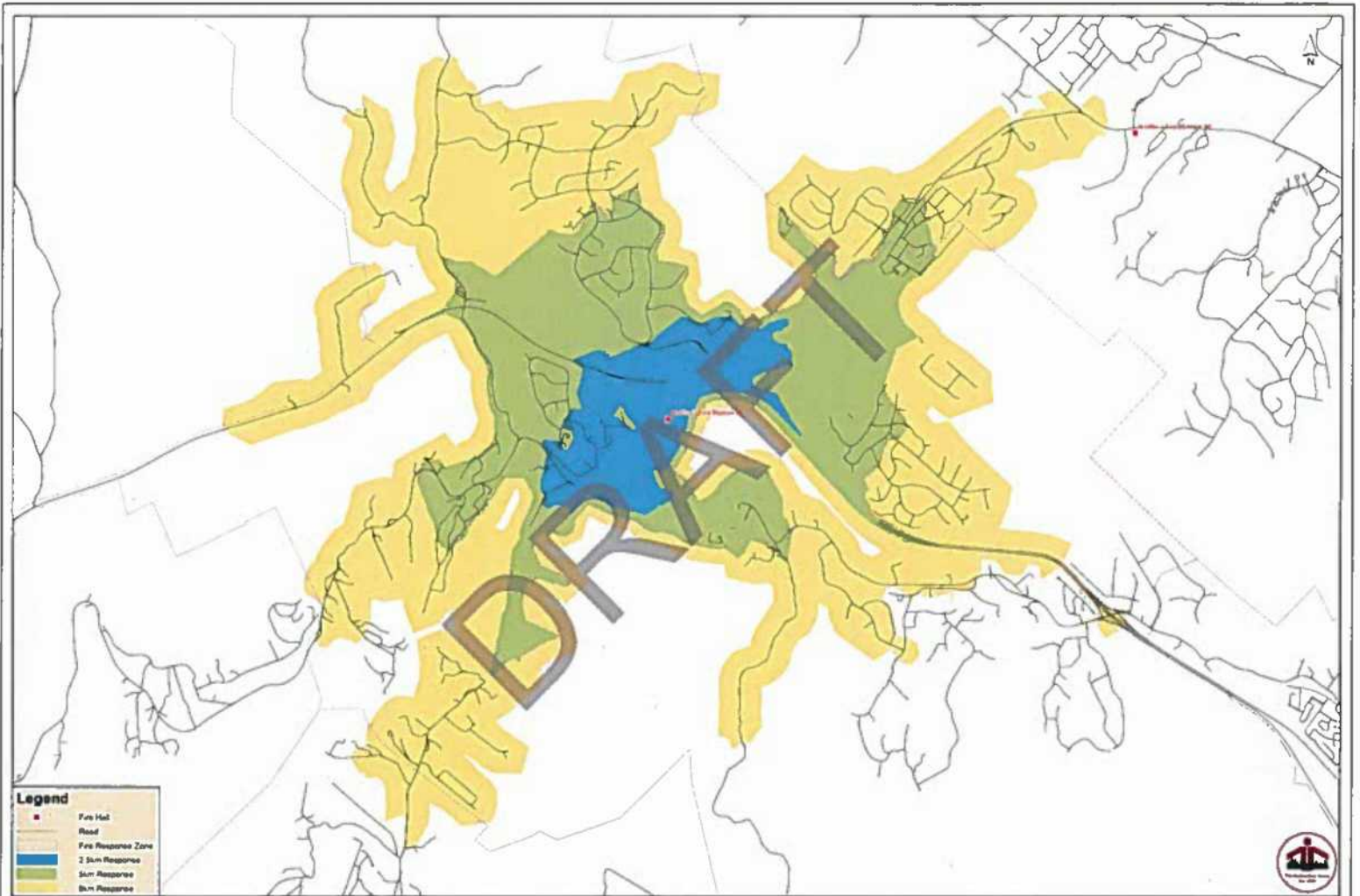
Facilities

Facilities in a fire station should be adequate in both size and function to allow activities that take place within the fire station to be carried out easily and efficiently. Overall the station was found to be good condition. The station is new and has modern facilities. There is sufficient room for future growth in the station.

Communications Room

Communication rooms are required under the standard *NFPA 1221 Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems*. As such the rooms must be equipped with proper radio and backup power for dispatch requirements. Section 9 Emergency Communications of the report provides recommendations for improvements for communication equipment and systems.





Legend

- Fire Hall
- Road
- Fire Response Zone
- 2.5km Response
- 5km Response
- 8km Response



Regional Municipality of Halifax

Figure 1 - 2.5/5/8km Response from Fire Station 85

Scale = 1:16,000



Community Risk Profile – Response Zone 65

A fire hazard and risk assessment was conducted in each of the fire response zones across the Halifax Regional Municipality to aid in determining the community's fire protection needs and to assist in assessing the adequacy of the current fire protection capabilities. The base point for measuring fire risk and the resultant available and adequate response is the determination of Required Fire Flows. A total of 5,110 Required Fire Flows were calculated for Response Zone 65 as shown in Figure 2. The Basic Fire Flows assigned for Station 65 are shown in Table 2 below. The Basic Fire Flow is usually calculated as the 95th percentile RFF or the 5th highest in the response area. Considerations are given to the exposure risk, quantity of risks and types of distribution. The 95th percentile is typically used in areas such as rural communities which have larger separations between buildings and limited large fire flow requirements. The 5th highest is typically used in areas with higher exposures due to closely built older wood framed structures resulting in a high fire spread risk. The Basic Fire Flow for this zone is based on the 95th Percentile Required Fire Flow value which is 1,400 IGPM.

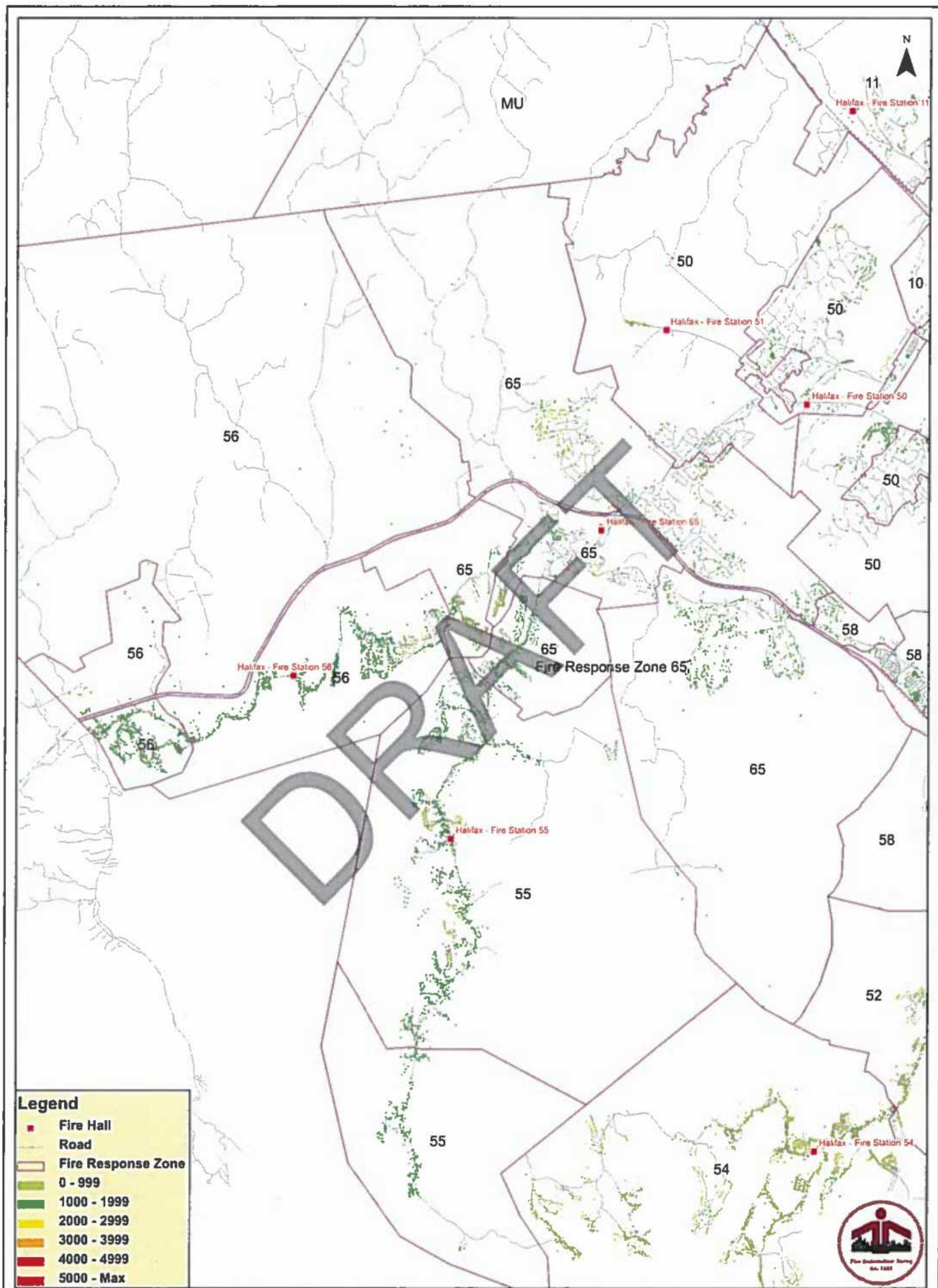
Table 1 Required Fire Flow ranges in Response Zone 65

RFF Range	No. of RFF points
0-999 IGPM	1,288
1000-1999 IGPM	3,799
2000-2999 IGPM	15
3000-3999 IGPM	5
4000-4999 IGPM	2
>=5000 IGPM	1

Table 2 Basic Fire Flows for HRM Response Zone 65

Total RFF Points	5,110	
	IGPM	L/s
90th Percentile	1,400	106.12
95th Percentile	1,400	106.12
Max	5,000	379.00
5th highest	3,300	250.14





Apparatus and Personnel

Based on the Basic Fire Flow of 1,400 IGPM, the benchmark number of apparatus required for Fire Station 65 is one Engine apparatus. Station 65 is equipped with one Engine. Standard staffing for Station 65 is 27 volunteers and an E- Platoon of four firefighters. This staffing assignment is required to meet the growing daytime demand within the area.

Fire Calls

In the period from January 2010 until September 2013, Station 65 had 898 emergency calls with the following breakdown as shown in Table 3 and Figure 3 and 4 below. Calls labelled as "Other" and "Coding" include calls whereby apparatus returned to the station or those for which the type of call could not be identified. Depending on how call numbers were coded or drawn from the master sheet, the total number of calls in Table 3 may differ from those in Table 4. The year average was calculated for all calls over the 45 months reviewed.

The majority of calls to Station 65 were Medical emergencies at 36.8 percent of the total call volume.

Table 3 Emergency calls by Incident Type

Calls by Type			
Type	Total	Year Average	Percentage (%)
Fire	80	21	8.91
False alarm	101	27	11.25
Smoke	47	13	5.23
Motor Vehicle Accident	118	31	13.14
Oil or Gas spill	0	0	0.00
Other	15	4	1.67
Rescue	1	0	0.11
Medical Assist	331	88	36.86
Coding	205	55	22.83



Figure 3 Emergency Calls by Incident Type (2010-2013)

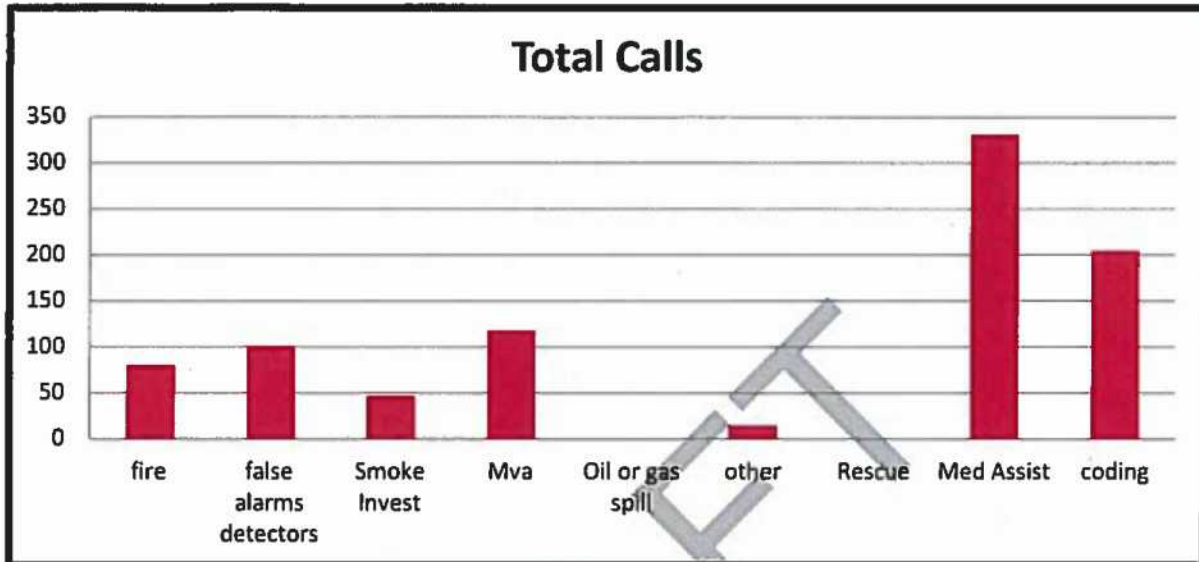


Figure 4 Percentage of Calls by Incident Type (2010-2013)

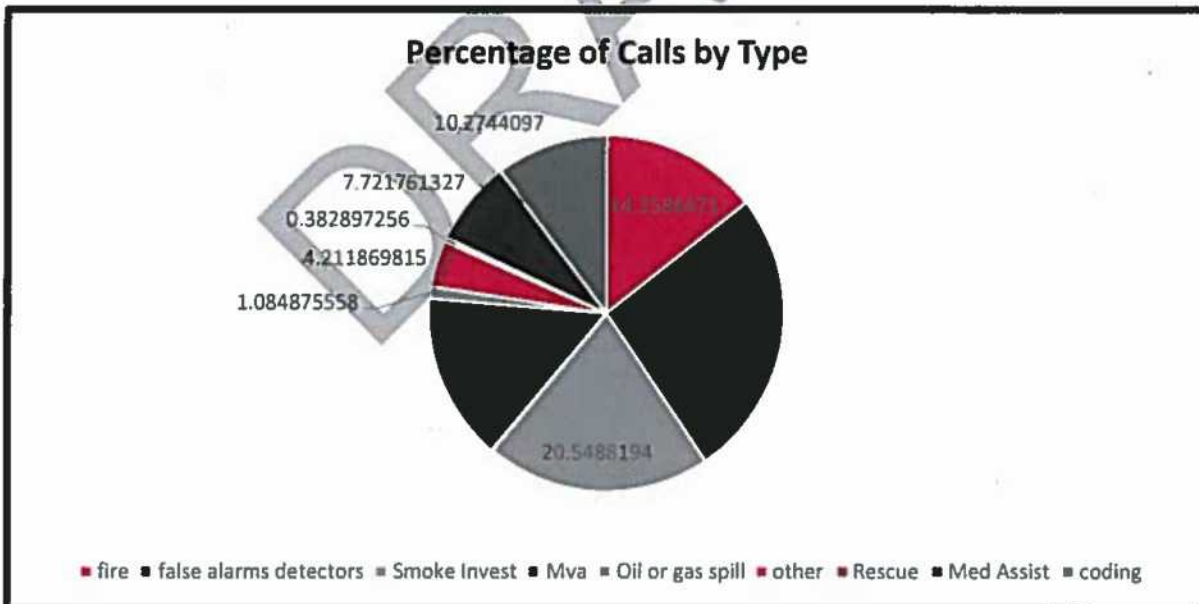


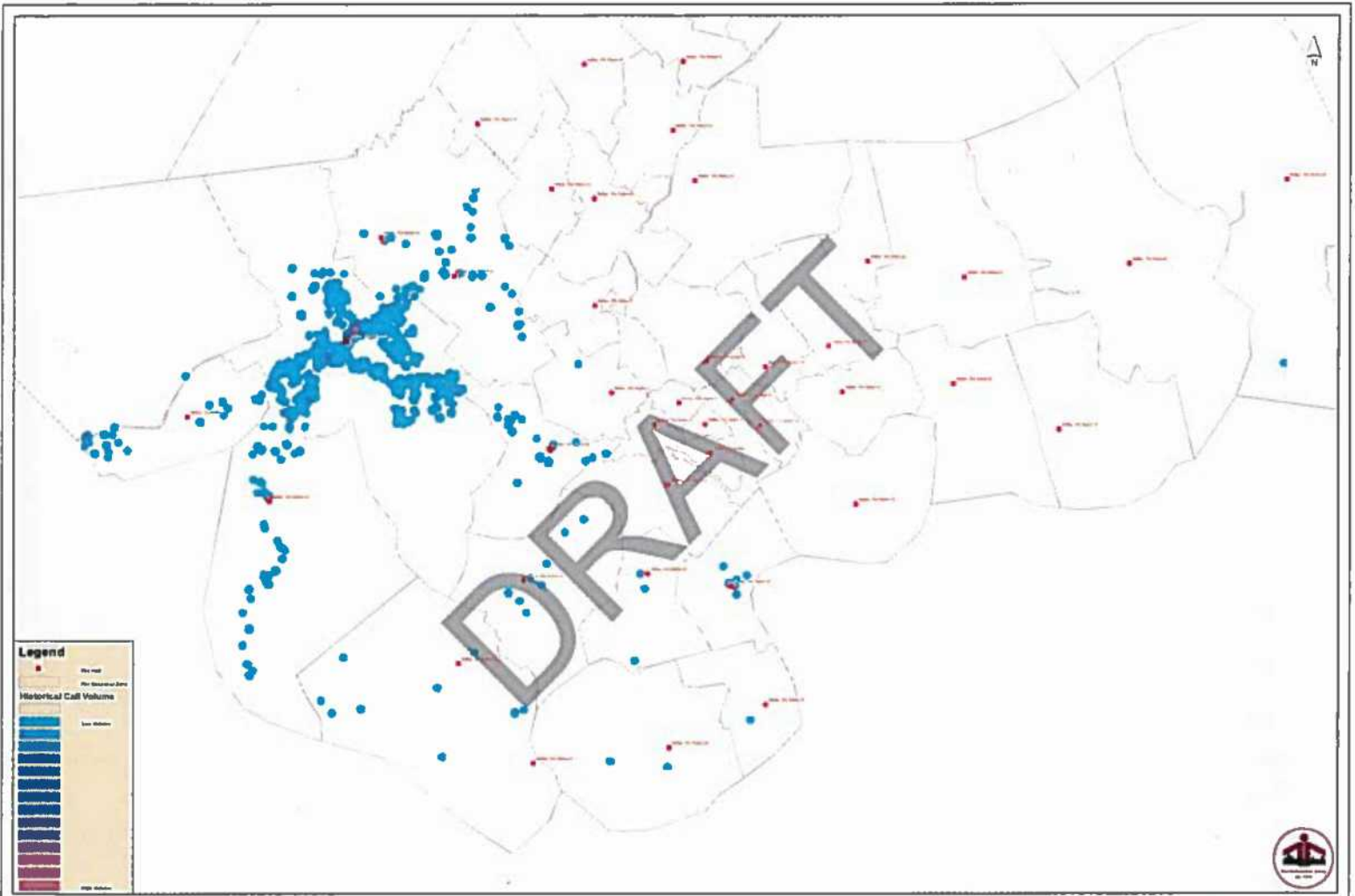
Table 4 is a breakdown of the fire calls by time of day for Station 65. The total number of calls in Table 4 does not include calls whereby apparatus returned to the station or those for which the type of call could not be identified. The bulk of the calls are daytime and evening responses in this area. Protocols must be established to allow for a multiple response for the daytime call volume when volunteers are less likely to be available.

Table 4 Emergency calls based on time of day

Period	Time	No. of Calls	% of Total Calls
Overnight	00:00 – 06:59	105	12.2%
Daytime	07:00 – 16:59	435	50.7%
Evening	17:00 – 23:59	318	37.1%

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Fire Insurance Grading

Fire insurance grades are calculated as a single point in time measurement of fire risk and fire protection. The measurement is intended to be representative of the normal level of fire risk and fire protection resources in a municipality at some given point in time. It is considered from the perspective of property protection as opposed to life safety. As described in the main body of the report, the final grading classification is determined from four relative classifications with differing weights – Water Supplies (30%), Fire Department (40%), Fire Prevention and Safety Control (20%) and Emergency Communications (10%).

Fire Station 65 was assigned a Public Fire Protection Classification of 8 and Dwelling Protection Grade 3B.

Recommendations

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



Appendix C – Available Fire Flow Test Location

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