Campbellton Regional Community Fire Master Plan

2025-04-10

POMAX
CONSULTING

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Executive Summary and Introduction

Purpose

This report is the culmination of a fire master plan project, the goal of which was to

- assess all aspects of the fire service and fire protection service delivery in the new municipality;
- review existing fire station locations relative to service demands and consider potential relocation or station changes;
- review the existing fleet and the respective vehicle replacement plans relative to current and future service demands;
- review the fleet and equipment locations relative to service demands and consider potential relocation;
- review staffing levels in relation to service demand and consider possible modifications;
- provide a systematic and comprehensive approach to identifying fire and life safety risks in the community;
- recommend the establishment of strategic priorities for the fire department; and
- optimize fire protection services to the community.

What are Master Plans?

A master plan is a document that shows the municipality's vision of the fire protection system – which includes preventing incidents from occurring as well as responding – in the next 5 to 20 years or more. Master plans are – or should be – based on data, analysis, quantification, risk options, cost, and decisions. Fire service master plans are straight-forward to accomplish but not easy. They are, in their simplest form,

- a result of deep diving into multi-years of fire service response data and records;
- correlating the data with changes in the protected area during the same years as the data gathered, which includes population, land area, demographics, development, and economy;
- establishing patterns within incidents, response, and outcome; and
- establishing a risk profile based on the correlation.

The resulting information, combined with population and demographic forecasts from StatCan, the Province of New Brunswick, and the municipality, plus official plans and site-specific planning, will assist to forecast expected human and physical resource needs and timing – and associated costs – for the master plan duration.

The **strategic** part of a master plan is conceptual and short term[1] That is, it should support the Vision, Mission, and Values of a municipality while establishing, adjusting, or supporting the fire service's vision. The strategy and plan should allow Campbellton Regional Community, and its fire service, to make the best use of resources and outline a logical, phased, change plan that includes maximizing the benefit of the fire service's human and capital assets.

Most important to establishing a master plan and the strategic priorities being pursued as part of the goal of this assignment, is accurate data which can be used to correctly measure the success of a strategy. Data accuracy is critical to the determination of performance and the work of the fire department. Data correctness has a direct correlation to the effectiveness of risk reduction or mitigation program delivery efforts, as well as measuring the resource requirements and capability of the fire service.

Unfortunately, there are weaknesses in the data from some of the fire stations, but opportunities exist to improve future reporting that will assist Campbellton Regional Community to determine additional efficiency and effectiveness possibilities for the fire service.

Data Considerations

The intent of this report is to explain to council the options available for providing fire safety services in the community, assist council by detailing the opportunities and risks of the options and, ultimately, encourage council to restructure the fire department so that its main focus is that of fire prevention and reduction of incidents and for all staff to participate in achieving that goal.

Of primary importance is the implementation of a performance management and accountability effectiveness administrative model. This means that all activities of the fire service should be critically measured and evaluated, and revisions made based on quantifiable information.

Currently, achieving any form of accountability model is very difficult because of a lack of dependable data, both in the traditional form of tracking vehicle movement and associated times, and that of outcome data – also known as the value perspective – which is not part of the data easily available in Campbellton Regional Community or other fire departments. The latter (value), which we will explain in this report, is critical for evaluating fire department services and curtailing costs. A competent data gathering system

- adds value to managing the overall direction of the fire and emergency services system;

[1] Strategy evaluation should recur after approximately three years to determine if the approach is working or needs to be adjusted. Master planning is longer term (up to 20 years) that is focused on change and the resources (people, fixed properties, etc.) to manage that change.

- enables an ongoing assessment of the relevancy of programs, objectives, and strategies to the new municipality's vision of public safety and service delivery, and
- contributes to continuous improvement by
  - critically reviewing services provided by the fire department and the results of providing services,
  - managing risks,
  - taking corrective action, and
  - realigning plans.

There are three kinds of fire department data described in Table 1, below

- input data,
- output data, and
- outcome data.

Table 1: Data Types

Input Data	Output Data	Outcome data
Assets & resources: stations, vehicles, staff, equipment	Turnout time, response time, number of firefighters responding or on scene	On scene activity, who did what, objective evaluation of benefit, subjective evaluation – the Value Measurement
Almost always gathered	Often gathered	Rarely gathered; never in a database relative to input and output data

Developing a data gathering and reporting system that encompasses these three data types will enable the city to balance resources with need. Nevertheless, the overall intent of this fire master plan is to assist the Regional Community and to invest in its fire service based on evidence, while improving the fire safety of residents and visitors by reducing the number of fires.

Fire Service Organization

The new municipality's fire service system is made up of stations in Atholville, Campbellton, Saint-Arthur, Tide Head, and Val D'Amour. All but Campbellton area are volunteer stations led by volunteer Chiefs. Campbellton area has a full-time Chief and four full-time firefighters allowing one firefighter to be on duty 24 hours a day.

Report Design

This report is designed, first, to provide facts relating to fire services that are important for the municipality to know, then we will relate those specifically and objectively to the CRC, and then

we will move into the subjective aspects of fire and emergency services protection along with our recommendations.

Traditionally fire master plans address items such as the number of firefighters; station locations and their number; speed of response; assets; and other customary, conventional fire service issues. This fire plan acknowledges the need to continue to measure speed of response and resources where necessary, but also concentrates on offering the fire department the tools required to improve effectiveness and efficiency, which are outcomes. As mentioned earlier, good record keeping and analysis is a primary requirement for productivity improvement.

Fire master plans should also discuss organizational and administrative aspects that can improve efficiency and effectiveness and avoid future expenses and growth (the strategy parts). In the few cases where a fire plan does suggest a competent organizational design, the positions recommended to make a fire service successful, efficient, and effective are often considered optional or a second tier of importance when funding considerations are brought into play. But they are not. In fact, offsetting costs in the future requires a capable organizational strategy in the present. One of the objectives of this fire plan report is to demonstrate how a shift from those customary, traditional plan designs can improve effectiveness and avoid costs.

Recommendations Summary

In theory, acting on any of the following recommendations can occur upon council approval. But the practicality is that many will require extensive planning and be dependent upon the availability and cooperation of agencies internal and external to the municipality such as Information Technology, Public Works, Bathurst Police and 911 Centre, the RCMP, Ambulance New Brunswick, and others. Therefore our suggestion, and offer, is that once Council determines which recommendations are acceptable, Pomax will remain available (if needed) to work with the municipality, the fire service, and partners to build a comprehensive project plan, within MS Project, to ensure successful implementation.

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Therefore our suggestion, and offer, is that once Council determines which recommendations are acceptable, Pomax will remain available (if needed) to work with the municipality, the fire service, and partners to build a comprehensive project plan, within MS Project, to ensure successful implementation.

Overarching recommendations

- Adopt a strategy of containing costs and allocating assets based on statistics.
- Embrace a data based activity culture within the fire service.
- Implement evidence informed response practices:
  - Conduct an outcome review of all incident responses to determine activity value.
- Develop an incident outcome database that can be cross referenced to the existing record management system.
- Reduce public risk through education and prevention programs.

From Section 2.3 Data Gap

The fire service should work with the municipality's information technology section to develop a spreadsheet-based outcome data system, which can be combined with data recorded in steps 1, 2, and 4 (Exhibit 3) resulting in a relational database.

From Section 4 Working with Communications Centres

Refine information gathering and dispatch techniques at the communications centre to determine the frequency and circumstances for dispatching the fire service to traffic incidents.

We recommend the following techniques to refine dispatch procedures and improve fire service resource value.

1. In concert with the recommendations below, the fire department should seek peer reviewed studies from scientific journals or other impartial publications to either confirm or question existing response methods.
   a. There are large number of journal articles that examine the need, or absence of evidence, for response by fire departments to a broad number of call types. By familiarizing itself with similar journal articles the fire department can examine current responses that could be adjusted, thereby increasing value and lowering fire service operational costs, and achieve guidance as to which actions should be reviewed with the dispatch centre.
2. Create a joint dispatch service planning group – possibly including other fire departments dispatched by the same communications centre – for the purpose of reviewing selected incidents and refining dispatch information gathering and dispatch techniques.
3. The fire service should review a sample of emergency calls, including listening to the dispatch centre's recordings from the moment a call is received at the 9-1-1 centre, or fire dispatch, until scene arrival and incident assessment. This is quality improvement best practice. Campbellton Regional Community responds to approximately a call per day on average so almost all calls could be reviewed, but a minimum of 10 events of all types should be appraised monthly.

a. Review the recording to see what information was received by the call taker and the effort made to determine the full nature of the call so that effective and efficient resources are sent to incidents.
b. Determine how the deployment of assets could be reevaluated thereby resulting in greater efficiency and reduced risk to firefighters and the public from large fire trucks responding in emergency mode.
c. Work with 9-1-1, police, and paramedic services' dispatch centres to recognize information patterns at the call-taking stage to eventually increase efficiency of call-taking and dispatch processes.

4. Review outcome data (officers' notes) manually until a record management system is developed sufficiently to record on-scene activity in a relational database.
   a. Equate information gathered at the call taking stage with as-found information at the scene for congruency.
   b. Work with the dispatch centres (9-1-1, police, fire, paramedic services) to find techniques for querying callers so that information gathered more closely aligns with 'as found' on scene.
5. Except in cases such as confirmed fires, confirmed cardiac arrest, and a few other emergencies where minutes might count, the dispatch centre should take time to obtain additional information which may reduce the number of times firefighters are dispatched.

From Section 7.1.1 The number of incidents is being overcounted

Pomax manually counted and reviewed each structure fire incident and found that some fires were being double and triple counted, and two were counted four times. The same practice occurs with other call types, but structure fire responses are most obvious because multiple vehicles are often dispatched.

We recommend that the fire department should work with the Bathurst Dispatch Centre to revise the way incidents are recorded.

From Section 7.3 Station and Apparatus Resources

Decommission the Tide Head and Atholville stations and rationalize the distribution of apparatus throughout the Campbellton Regional Community. We make this recommendation based on the low number of incidents in and around the two locations, the proximity of the Campbellton area station, and because the data indicates three stations in close proximity, considering the low number of events, aren't required.

Alternatively, if council determines it is best for both stations to remain open, we recommend

- housing only one pumper at each station; backup for the few structure fires would be from Tide Head and Campbellton area for Atholville, and from Atholville and Campbellton area for Tide Head,

- use one of the pumper vehicles to replace the 2006 International pumper in Val D'Amour (the 2006 pumper can be reserved as a backup for maintenance and repair purposes),
- relocate the 2018 Atholville rescue to the Campbellton area station to replace the 1999 rescue (even though it has low mileage).

From Section 7.4 Organization of the fire department

From Section 8.1 Services that should be provided by the fire department

The municipality should employ a strategy of using outcome data to determine the need for response and then ensure the types of incidents to which the fire department responds, and the level of service offered, are captured in a fire department establishing and regulating bylaw.

From Section 8.5 Attending Traffic Incidents

The Regional Community should disengage from the NB 911 Motor Vehicle Collision Operating Directives agreement (Appendix A) but the Regional Community should advise the 911 Centre, in writing, that the fire department will respond to traffic incidents where bystanders or witnesses report entrapment, fire, or other reasons for fire to attend, but not because of keywords as included in the NB 911 Motor Vehicle Collision Operating Directives.

From Section 8.6 Automatic alarms

Automatic fire alarms in the Campbellton area have a 99.4% false rate. Our recommendation is to moderate response by sending only one person to investigate alarm activation. There are exceptions to this recommendation such as when industrial or business establishments aren't staffed.

From Section 8.7 Deployment of volunteers to incidents

From a health and safety perspective we would recommend that volunteers respond to the fire station, which is where gear should be kept, and respond to an incident as a team. The practicality of that may be different.

We recommend a policy that volunteers respond to the fire station, but with exceptions such as cardiac arrest. There are likely other exceptions so any policy will require monitoring, information gathering, and adjustment.

From Section 8.8 Future steps

We recommend the adoption of a strategy of containing costs while improving public protection, and judicious asset reconciliation which includes not only decommissioning assets but also acquisition based on robust data.

1 Understanding Fire Response to Emergencies and Risk

This is the complex, yet critical, part of a fire master plan; that is, understanding what emergency response is, the true elapsed time that occurs, the levels of what is commonly referred to as an emergency, and tasks performed at different emergencies. Not everything is life-threatening; in fact, few 'emergencies' are life-threatening. Understanding emergency response is part of a risk analysis which leads to identifying gaps between fire department service levels and risk, and determining the best way to protect the public.

1.1 Understanding Emergency Response

Exhibit 1: Response Graphic (page 2) demonstrates the stages of an incident response. An emergency process includes

1. detection or recognition of a fire or other emergency;
2. reporting the emergency by calling 9-1-1;
3. call handling, dispatching firefighters, and preparation (also known as turnout) (the duration required for the communications centre to obtain information from a caller, alert the fire department, and firefighters departing the station);
4. driving time (wheels start turning to wheels stop turning);
5. setup (the 'action' time); for example,
    a) the time it takes to access equipment from a fire truck, travel from a truck [upon 'wheels stop turning'] to an incident such as an apartment or other location requiring vertical travel; or ground travel if firefighters have to move from the fire truck to the incident; for example, down railway tracks or to the back of a building; or
    b) the time it takes to access a victim, recognize the issue, and start definitive activity in a scenario other than fire; or
    c) the time it takes to prepare to investigate other incident types such as a smoke or carbon monoxide alarm; or
    d) the time it takes to connect to a hydrant, or water source, or foam.
6. harm limiting
    a) apply water or foam;
    b) care for victims.

Exhibit 1 demonstrates response to all types of events (incidents), Exhibit 2: Fire Response Graphic is more specific in a fire response situation.

Exhibit 1: Response Graphic

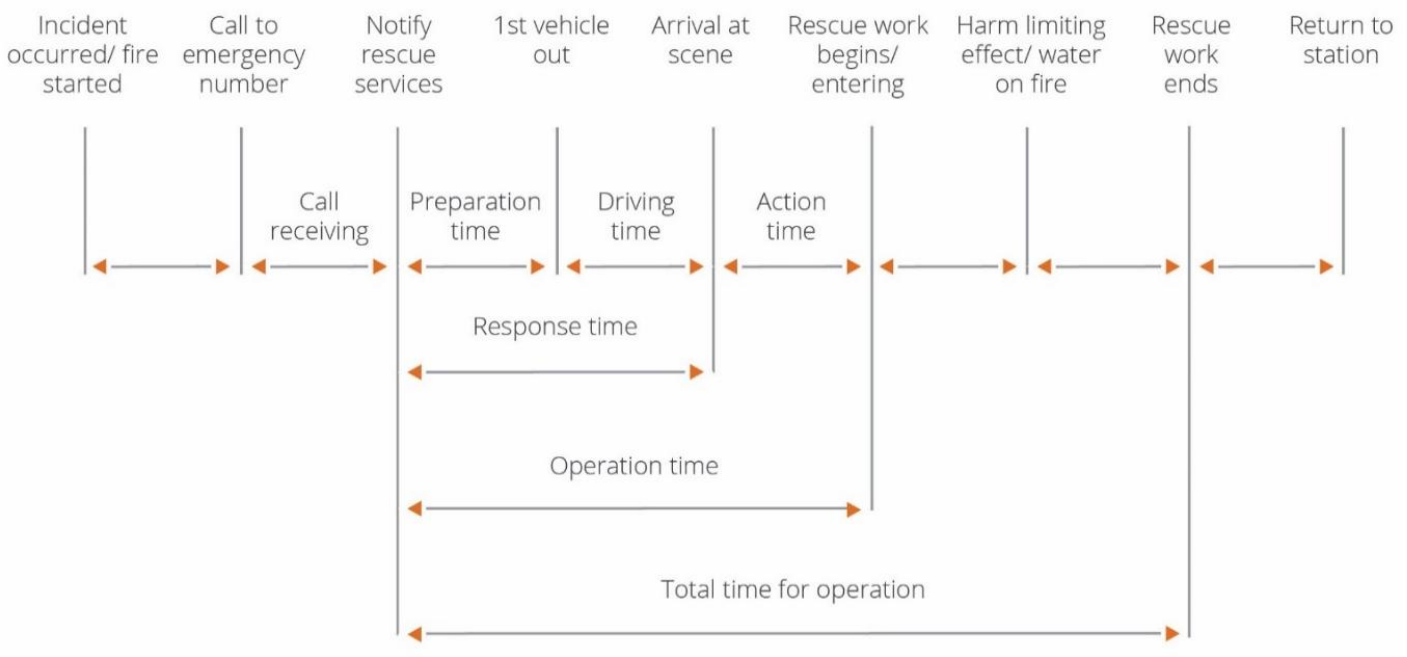
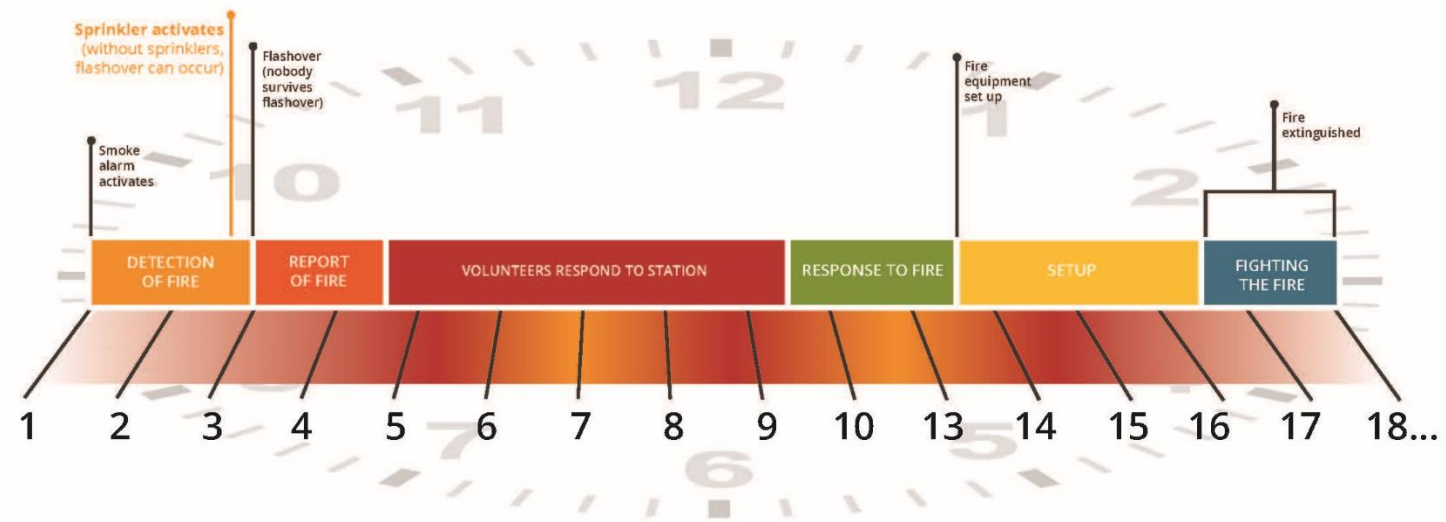


Exhibit 2: Fire Response Graphic is more specific in a fire response situation.

Exhibit 2: Fire Response Graphic



Sprinklers are activated by heat. Sprinkler initiation, at the approximately three-minute mark in Exhibit 2, above, assumes a fire has become sufficiently hot to actuate the sprinklers (if they exist). Some fires may not generate enough heat this early in the timeline.

The 'setup' time (between the 10 and 13-minute marks in Exhibit 2) indicates three minutes. Information from the Office of the Fire Marshal and Emergency Management, Ontario, provided in a 2016 inquest, indicates that, in Ontario, it takes an average of five to seven minutes to get agent (water or foam) on a fire after arriving at a scene. We expect that elapsed time is similar in New Brunswick as it is in Ontario. We have seen setup times as low as 2 minutes during demonstrations, but those were in a training site parking lot with a hydrant immediately available. Three minutes was chosen for this graphic even though it might be optimistic.

As Exhibit 2 shows, the elapsed time from the time of fire detection to applying water or foam can be over 13 minutes. This assumes a driving time of about four minutes. The proximity of a fire to a fire station or a change in driving time because of weather or terrain may affect the extent and duration of a fire before an agent is applied. Additionally, overall response can be negatively affected by impediments to gaining access to an incident; for example, fire in a multi-story building.

Except for the fire station located at 33 Roseberry Street in Campbellton where one firefighter is on duty, the balance of the stations is made up of volunteers who respond from home or other locations when an incident occurs. That means, in Exhibit 2, instead of it taking approximately 90 seconds to don firefighting gear and leave the station as is expected of full-time firefighters, volunteer on-call firefighters have to travel to the station then dress for firefighting. Therefore, the 'getting out of station time' (or turnout time) is about seven and a half minutes. This adds about six-minutes to overall scene arrival time. Even if some volunteers respond directly to an incident there is little they can do until a fire truck arrives.

Adding all the time components together means that from detection of a fire until the first truck arrives and water is applied, about 17 to 18 minutes elapse for the Campbellton area and Atholville stations – assuming that getting hoses off a truck and employing water can be accomplished in three minutes and the incident is within four minutes of a fire station – and up to 30 minutes for the Tide Head, Saint-Arthur, and Val D'Amour stations depending upon the reporting year[2].

It's not possible to put too fine a point on this observation: It's not the time it takes to drive a fire truck to a fire that is the most important factor, it's the time it takes to apply water or foam to a fire from the time the fire was discovered. The way to decrease the negative impact of the elongated times experienced in the municipality is through fire prevention and safety education.

[2] All measurements taken at the median for each station from 2018 to end of October 2023.

2 Campbellton Regional Community Fire Service Data

The charts in this section offer an overview of the incidents to which each station in the municipality was dispatched from January 1st, 2018, to the end of October 2024.

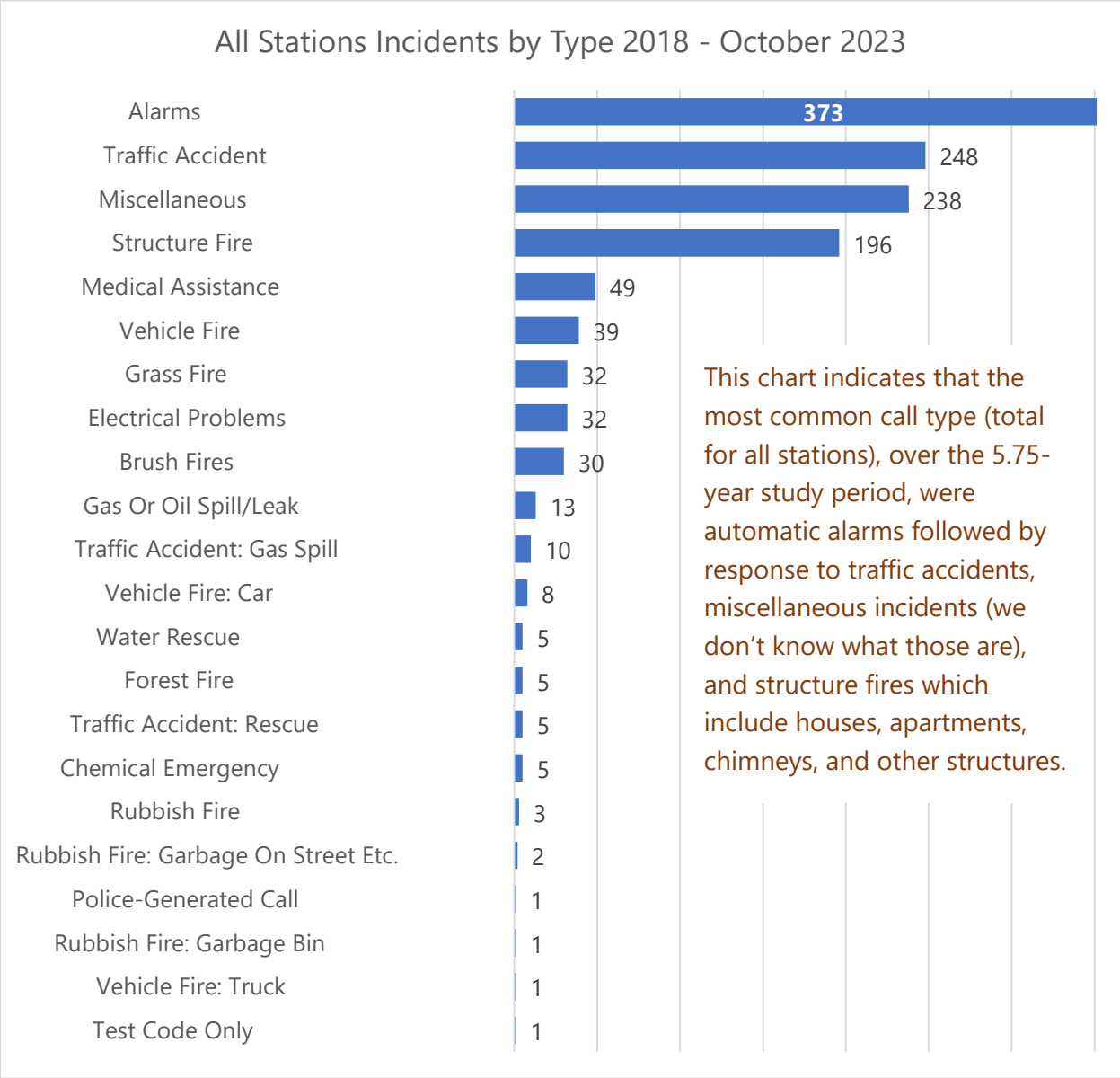
We are only moderately confident in the data presented because it shows incidents 'as dispatched' but does not show what was found upon arrival at the incident or the services provided by the fire department. For example, there are dispatch categories for Structure Fires; Structure Fire: House; Structure Fire: Apartment; and Chimney Fire (which is usually in a structure). Pomax has inquired of the dispatch centre as to the difference between a structure fire and other types of fires in a structure such as a house or apartment, but have not received an answer at the time of writing this report.

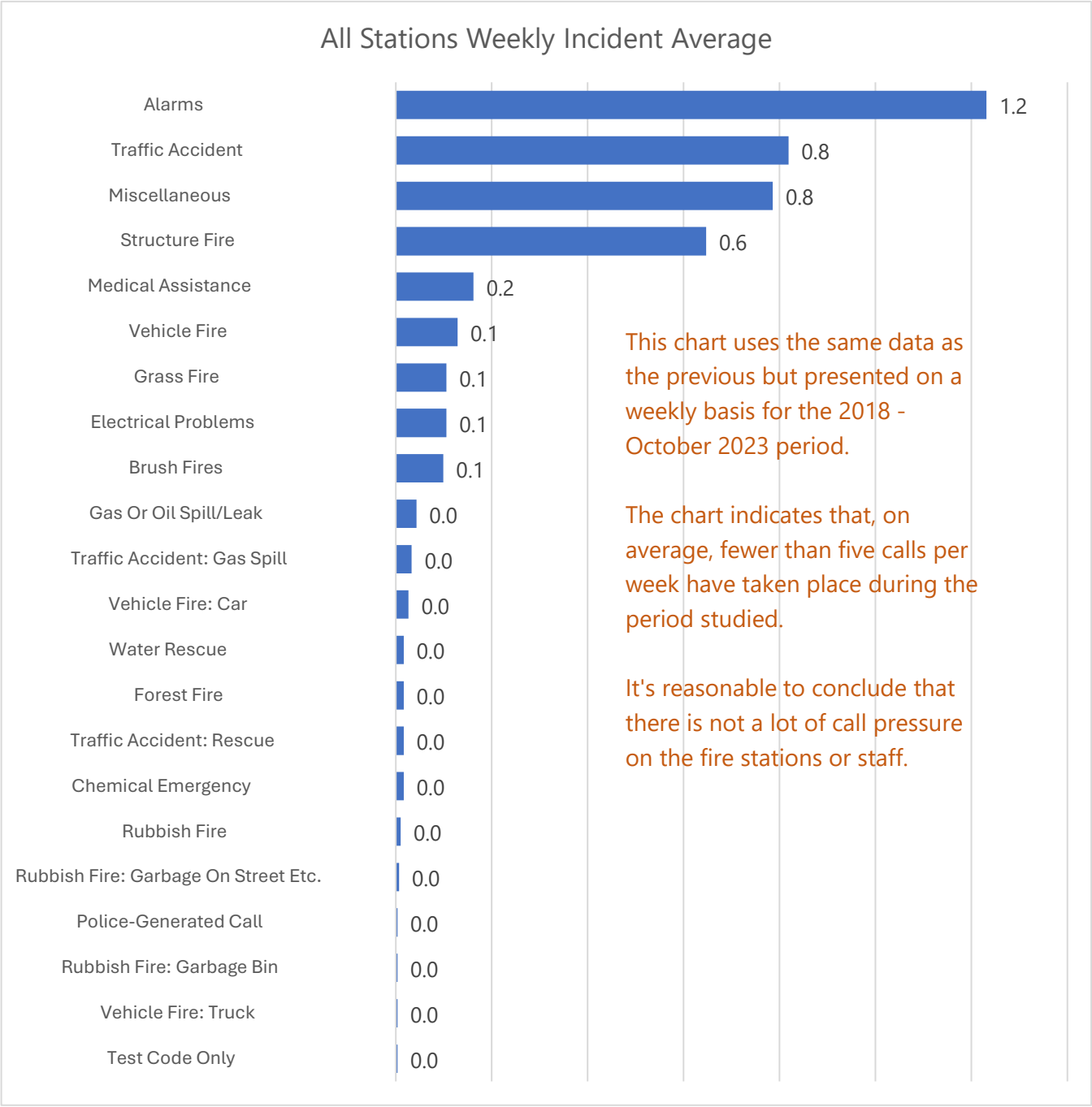
We have combined the above categories of structure fires into one incident type (Structure Fires) for the purpose of the data, but the number of fires sometimes seems out of balance for the population base. For example, Val D'Amour's data shows an average of over 10 structure fires a year (including chimney fires) in a population of fewer than 2,000. We would expect one to three fires a year in that population. Therefore, it's possible that some of this data is not accurate or that a concerted fire prevention and public education process should be focused on the Val D'Amour area.

2.1 Incident Responses All Stations

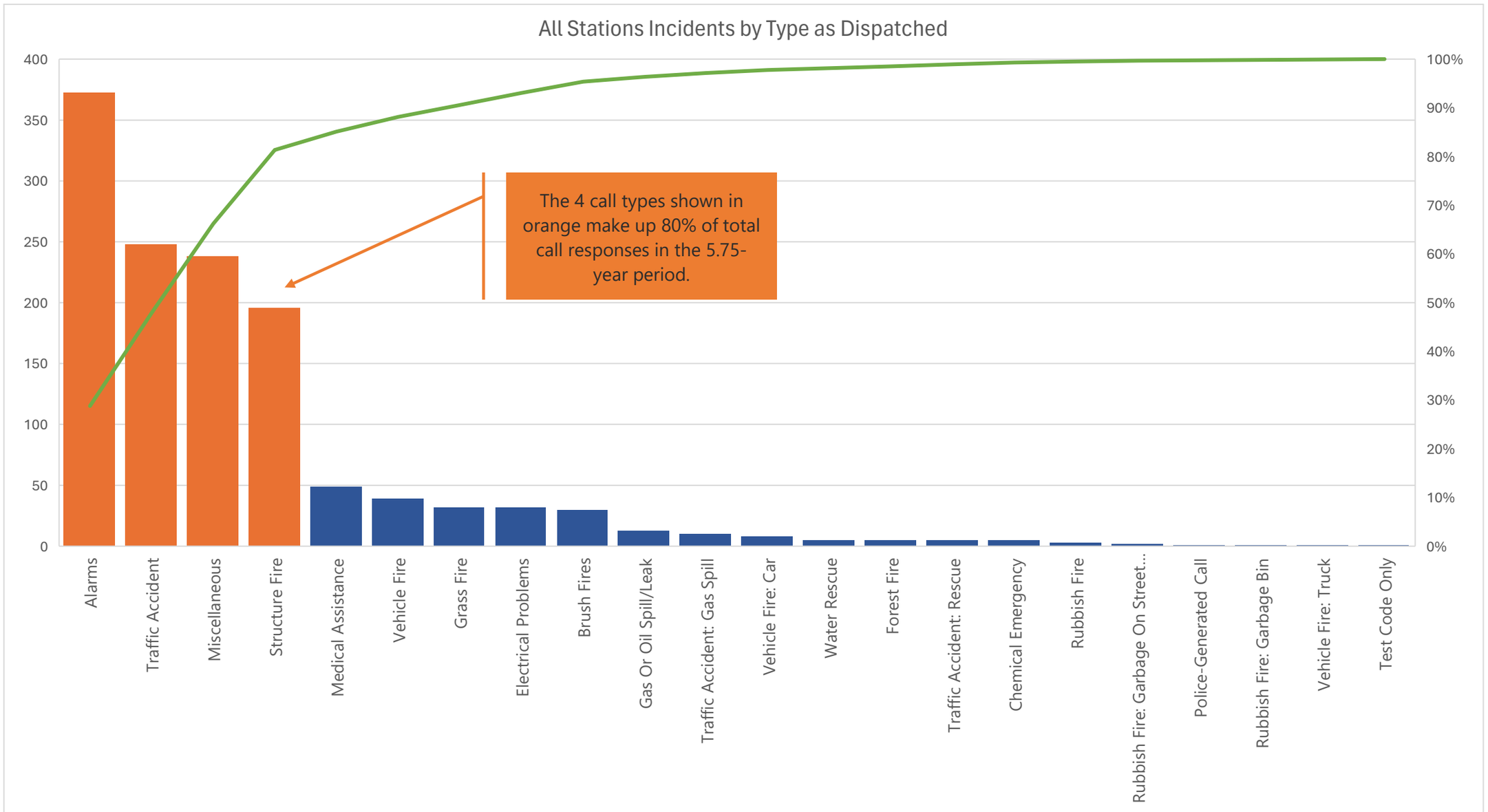
The following three charts – starting on the next page – indicate incident responses by type for the period 2018 to October of 2023. Comments are included in each chart.

Information is presented from the most frequent call type (incident type) first to the most infrequent last.


All Stations Incidents by Type 2018 - October 2023
Alarms 373
Traffic Accident 248
Miscellaneous 238
Structure Fire 196
Medical Assistance 49
Vehicle Fire 39
Grass Fire 32
Electrical Problems 32
Brush Fires 30
Gas Or Oil Spill/Leak 13
Traffic Accident: Gas Spill 10
Vehicle Fire: Car 8
Water Rescue 5
Forest Fire 5
Traffic Accident: Rescue 5
Chemical Emergency 5
Rubbish Fire 3
Rubbish Fire: Garbage On Street Etc. 2
Police-Generated Call 1
Rubbish Fire: Garbage Bin 1
Vehicle Fire: Truck 1
Test Code Only 1
This chart indicates that the most common call type (total for all stations), over the 5.75-year study period, were automatic alarms followed by response to traffic accidents, miscellaneous incidents (we don't know what those are), and structure fires which include houses, apartments, chimneys, and other structures.



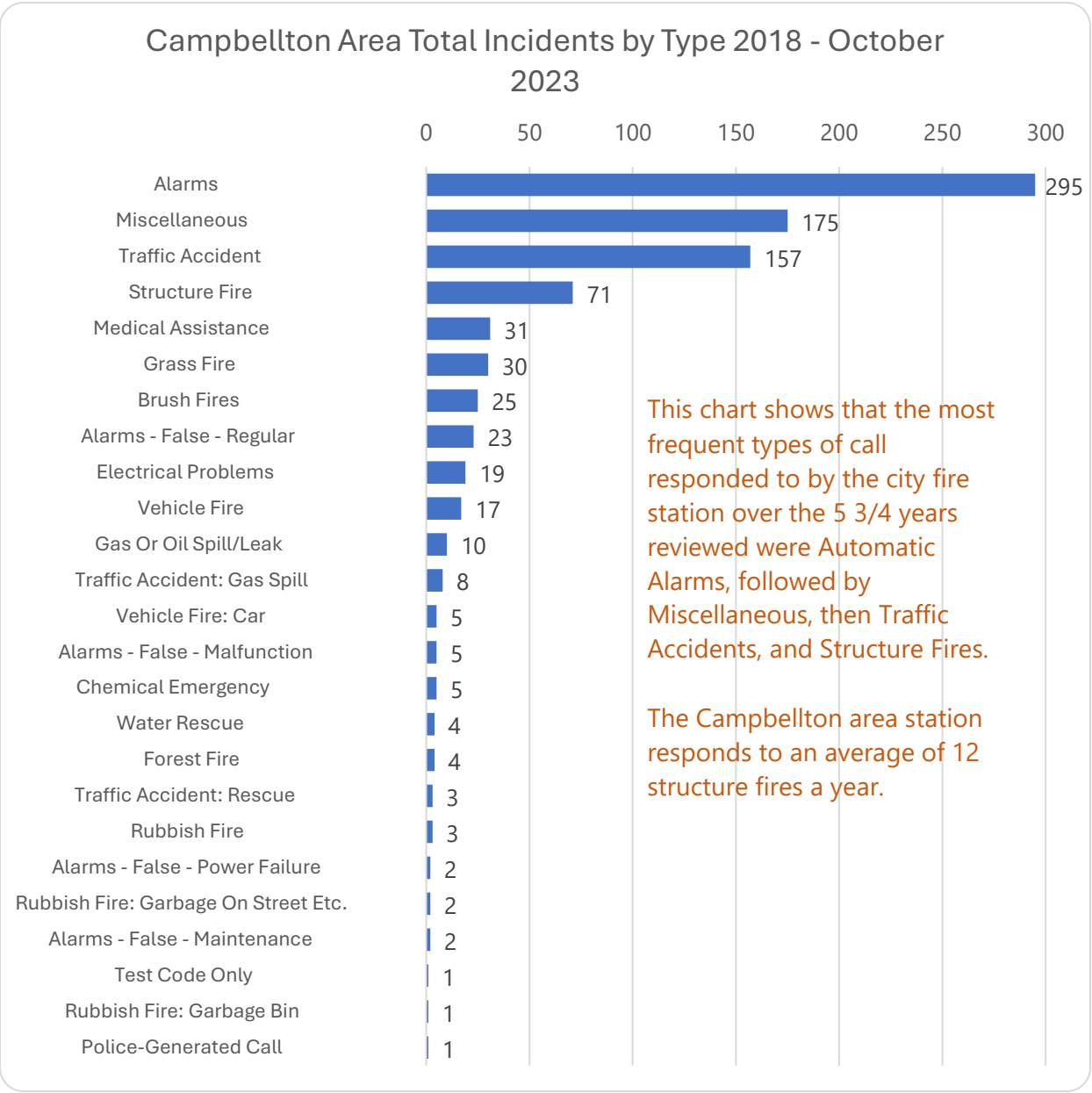
The Pareto Chart on the next page shows the call types that made up the majority of responses in the Regional Community from 2018 to October, 2023.

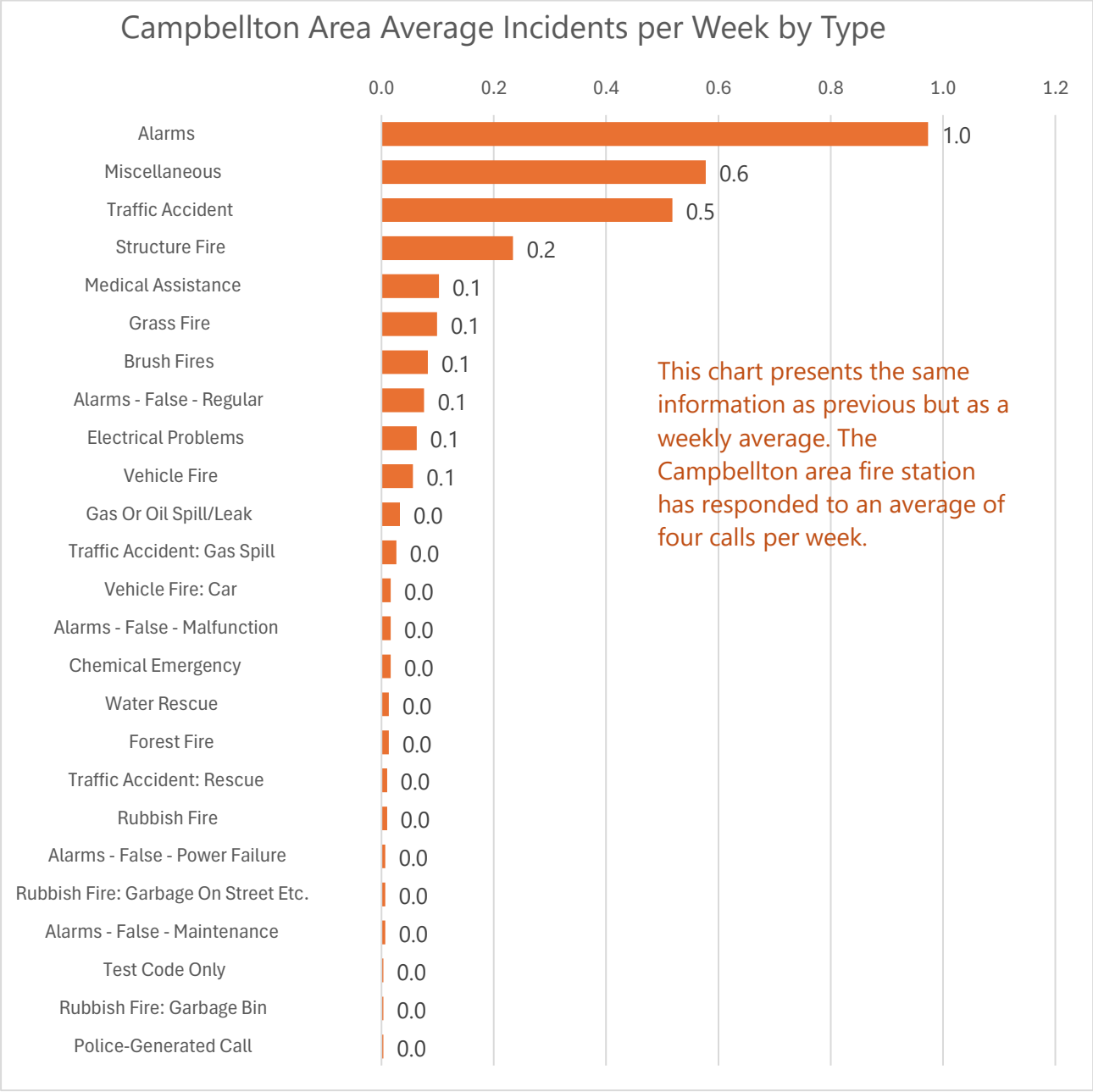

All Stations Incidents by Type as Dispatched
400
350
300
250
200
150
100
50
0
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
The 4 call types shown in orange make up 80% of total call responses in the 5.75-year period.
Alarms
Traffic Accident
Miscellaneous
Structure Fire
Medical Assistance
Vehicle Fire
Grass Fire
Electrical Problems
Brush Fires
Gas Or Oil Spill/Leak
Traffic Accident: Gas Spill
Vehicle Fire: Car
Water Rescue
Forest Fire
Traffic Accident: Rescue
Chemical Emergency
Rubbish Fire
Rubbish Fire: Garbage On Street...
Police-Generated Call
Rubbish Fire: Garbage Bin
Vehicle Fire: Truck
Test Code Only

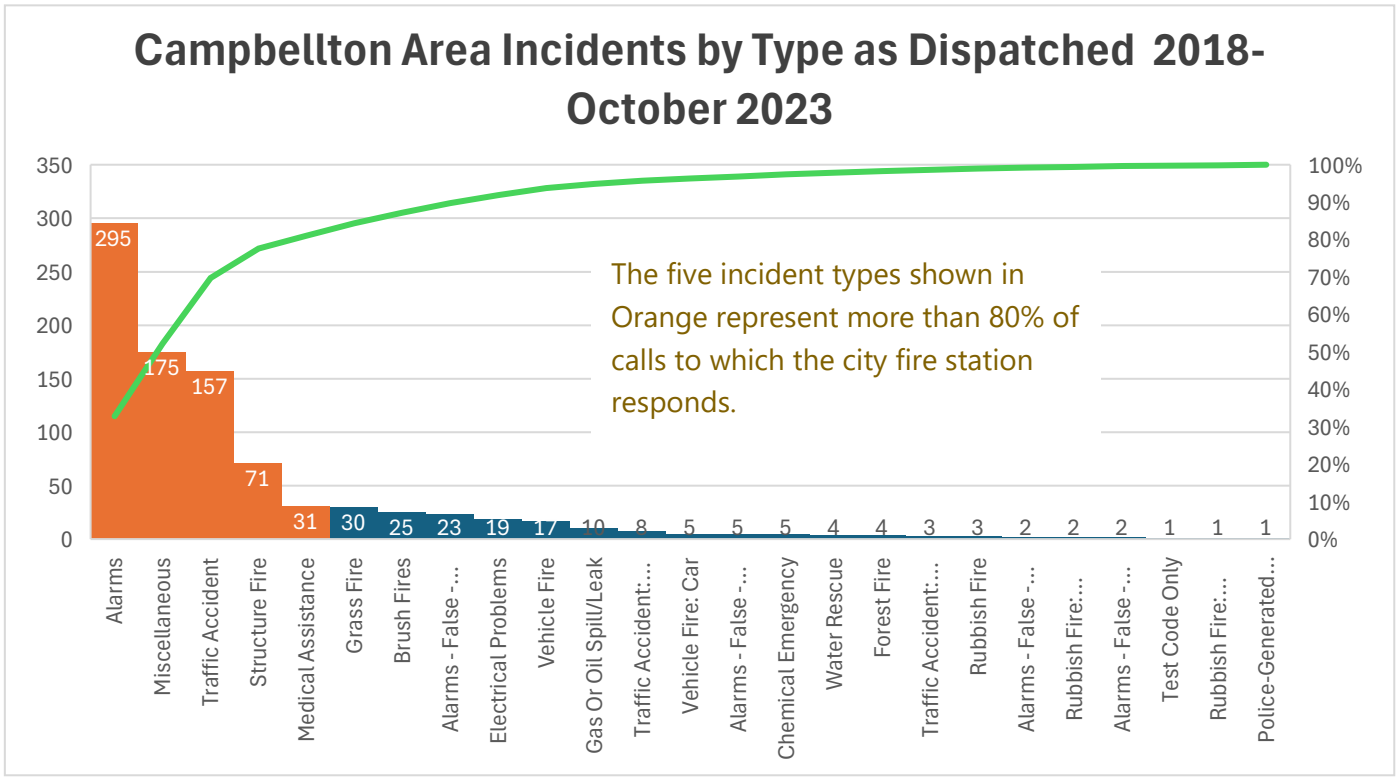
2.2 Station by Station Data

Data that follows presents information relative to each station. We start with the Campbellton area fire station since it has the greatest number of calls.

2.2.1 Campbellton Area Fire Station




Campbellton Area Average Incidents per Week by Type
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Alarms 1.0
Miscellaneous 0.6
Traffic Accident 0.5
Structure Fire 0.2
Medical Assistance 0.1
Grass Fire 0.1
Brush Fires 0.1
Alarms - False - Regular 0.1
Electrical Problems 0.1
Vehicle Fire 0.1
Gas Or Oil Spill/Leak 0.0
Traffic Accident: Gas Spill 0.0
Vehicle Fire: Car 0.0
Alarms - False - Malfunction 0.0
Chemical Emergency 0.0
Water Rescue 0.0
Forest Fire 0.0
Traffic Accident: Rescue 0.0
Rubbish Fire 0.0
Alarms - False - Power Failure 0.0
Rubbish Fire: Garbage On Street Etc. 0.0
Alarms - False - Maintenance 0.0
Test Code Only 0.0
Rubbish Fire: Garbage Bin 0.0
Police-Generated Call 0.0
This chart presents the same information as previous but as a weekly average. The Campbellton area fire station has responded to an average of four calls per week.



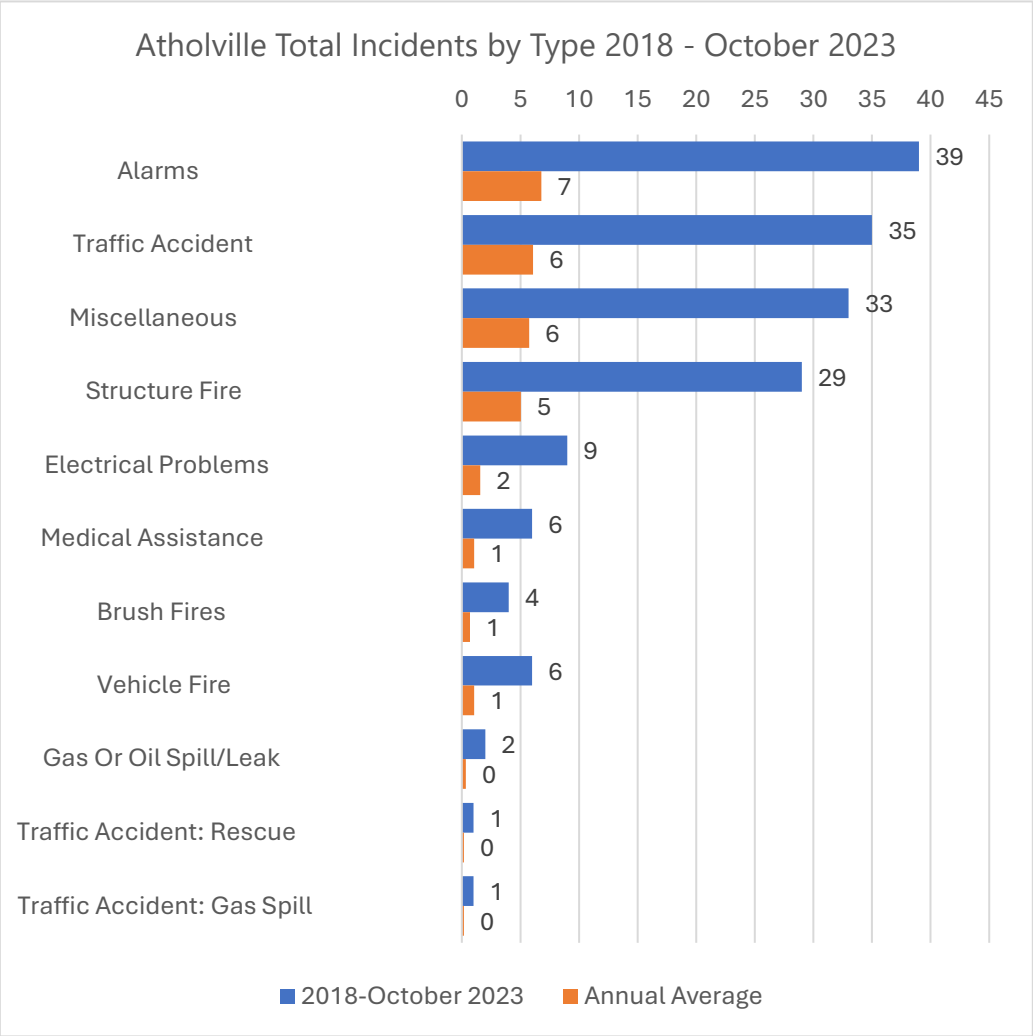
Only one chart is presented for the fire stations in Atholville, Saint-Arthur, Tide Head, and Val D'Amour since, due to the low call volume, one chart satisfactorily depicts the historical activity at each station.

Please note that whereas the averages presented in the Campbellton Regional Community and Campbellton area data were weekly, averages for Atholville, Saint-Arthur, Tide Head, and Val D'Amour are monthly because of the low incident volumes.

2.2.2 Atholville Fire Station

The blue bars in the following chart represent the total incidents by type for the 5.75-year period reviewed, and the orange bars show the annual average for that duration. Atholville has responded to an average of approximately three incidents per month.

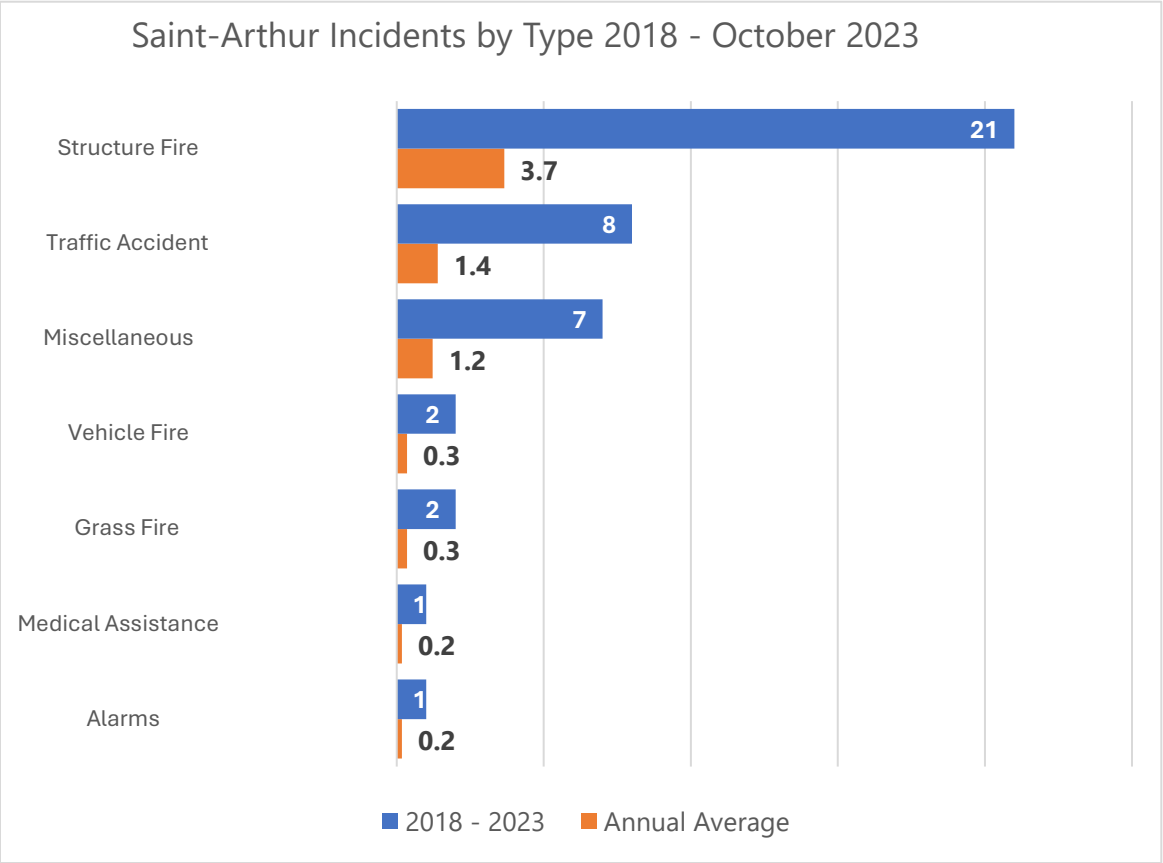
Structure fires average approximately one every two months.



2.2.3 Saint-Arthur Fire Station

The blue bars represent the total incidents by type for the 5.75-year period reviewed, and the orange bars show the annual average for that duration. Saint Arthur responds to an average of approximately seven to eight incidents a year.

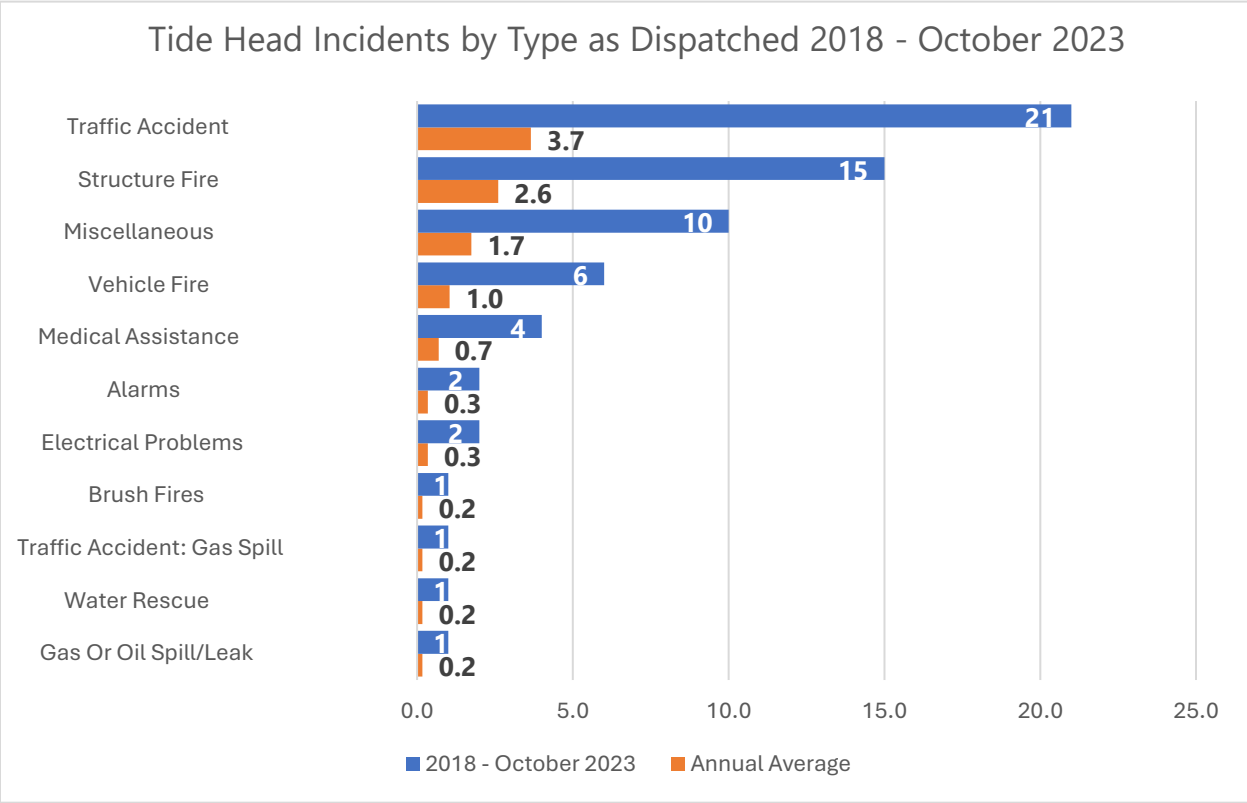
Structure fires have averaged approximately one every three or four months.



2.2.4 Tide Head Fire Station

The blue bars in the chart that follows represent the total incidents by type for the 5.75-year period reviewed, and the orange bars show the annual average for that duration. Tide Head responds to an average of approximately 11 incidents a year.

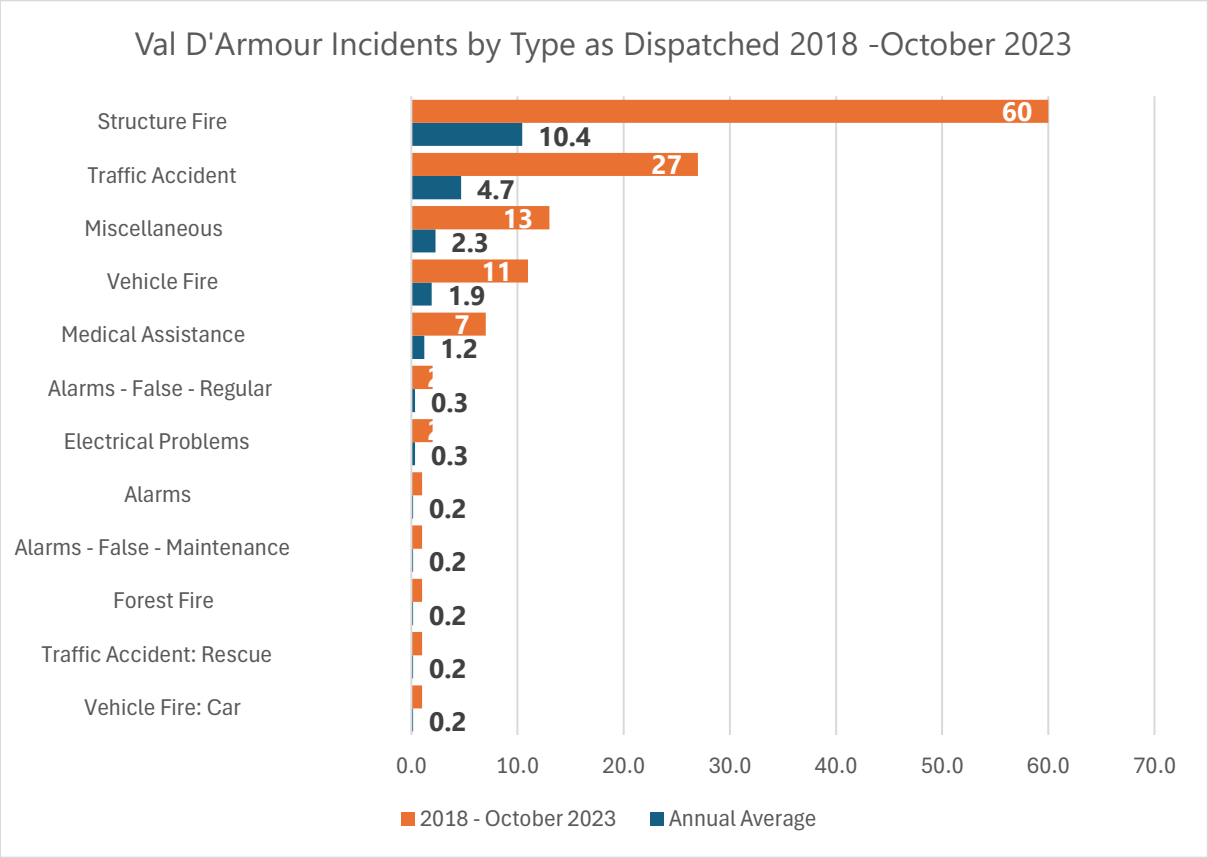
Structure fires have averaged approximately one every five or six months.



2.2.5 Val D'Amour Fire Station

The orange bars in the following chart represent the total incidents by type for the 5.75-year period reviewed. The blue bars show the annual average for that duration. Val D'Amour has responded to an annual average of approximately 22 incidents.

Structure fires have averaged slightly over 10 per year or .8 a month. The volume of fire incidents should be confirmed since the reported structure fire frequency is similar to Campbellton area but in a population of only 20% of Campbellton area. Also, please see *Section 7.1.1, The Number of Incidents is Being Overcounted*.



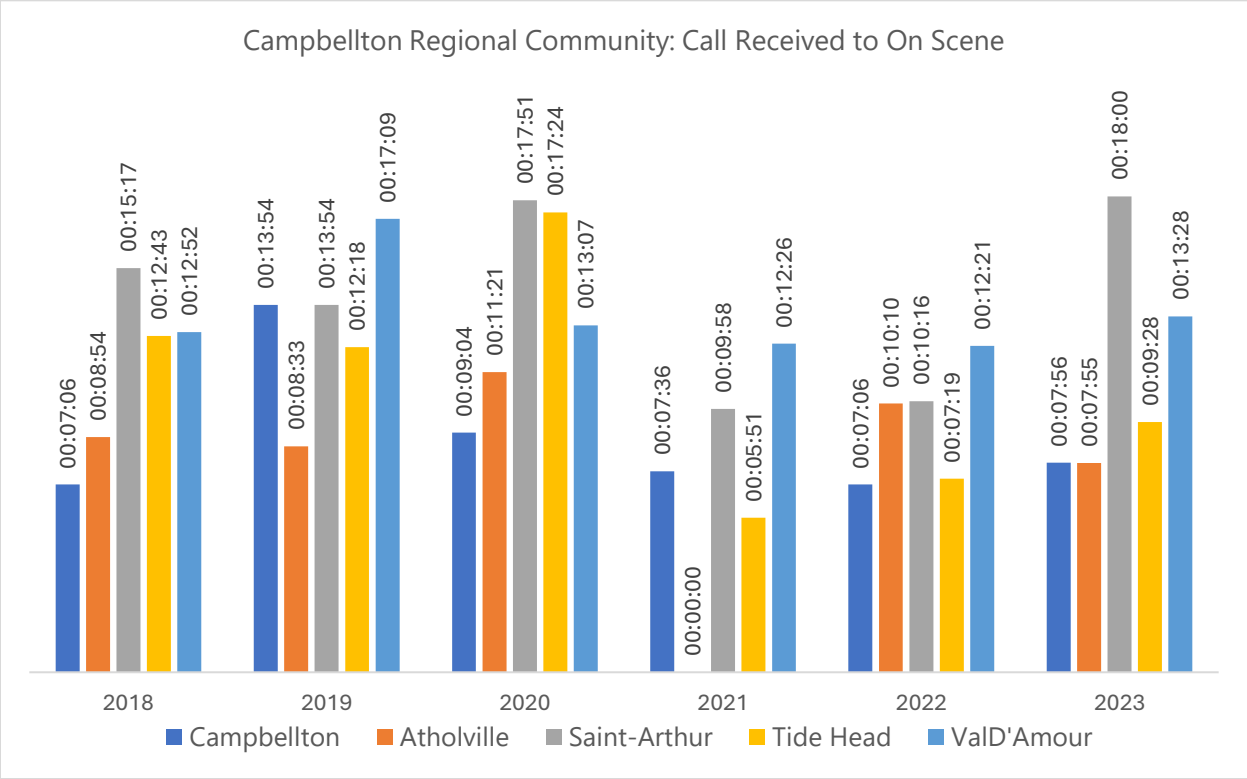
As part of the data review Pomax evaluated response times for each station, by year, and by type of call. We have not included all the detail in this report but will provide the work sheets and all elements to the Regional Community. However, the low volume of calls (the call sample) makes it difficult to reach conclusions since a variation in one or two calls will reveal what appear to be inconsistencies in time commitment.

The three charts that follow indicate the historical median[3] time for each station at each stage of structure fire incidents. The stages are

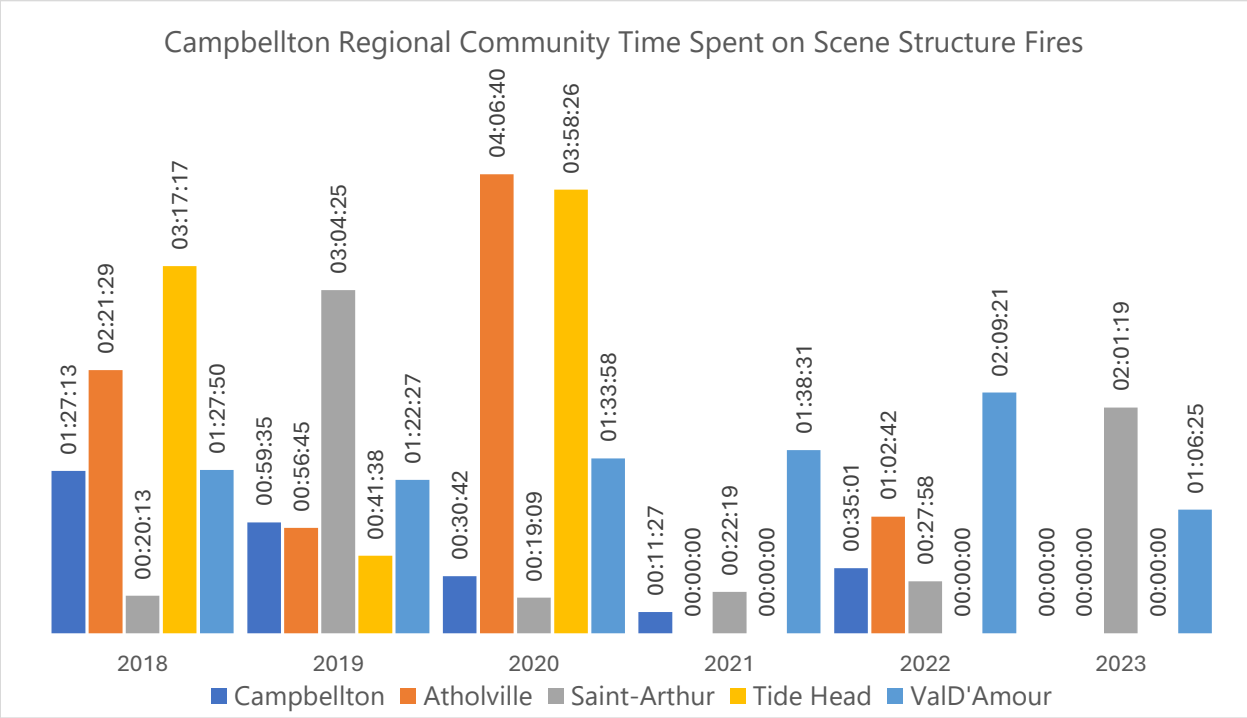
From	To	Shown in Chart Titled as:
Call received at the dispatch centre	The arrival time of the first vehicle at the incident.	Call Received to On Scene Structure Fires
Time arrived at the structure fire	Time departed structure fire	Time Spent on Scene Structure Fires
Time call received at the dispatch centre Vehicle and staff are ready for another response	The time first vehicle and crew are ready for another response	Time Call Received to Available for Another Call

[3] Half of all structure fire incidents took less time than that shown, half more. Keep in mind some stations have a very low structure fire call volume.

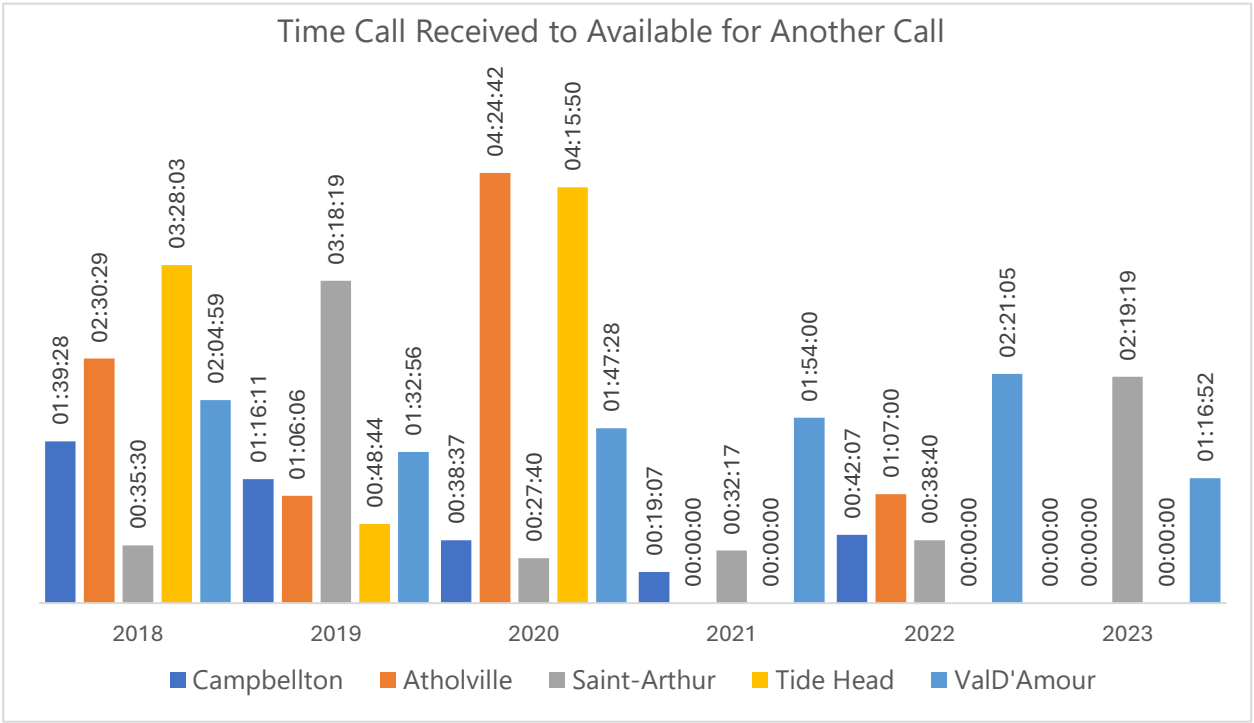
The absence of bars on the following charts indicates years within which no structure fires occurred, or times were not recorded.



The following chart, *Time Spent on Scene Structure Fires*, shows the time firefighters were on scene before they departed. Some of the on-scene times are very low, in fact minutes. There could be several reasons for this, and each incident would have to be checked manually. The most likely incident was firefighters arrived on scene and found there was no fire – a false alarm. But some of the times on scene are so low that another possibility is that firefighters were cancelled enroute. Finally, there might be an error in recording the times.



The chart below, *Time Call Received to Available for Another Call* indicates the total time commitment of fire fighters to structure fires at the median. This is the duration from the time the dispatch centre in Bathurst first receives a call until firefighters are clear of an incident and are available for another response. As was seen in the *Time Spent on Scene Structure Fires* chart, above, some of the times are very short, possibly for the same reasons noted earlier.



2.3 Data Gap

We commented earlier that there is only moderate confidence in the data presented in this report. We understand from the Bathurst communications centre that there are occasions when vehicle activity, such as the time of arriving at an incident, is not reported by firefighters, and Pomax is unable to report on activity that can't be measured. This is compounded by the small data sample because of low call volume.

Additionally, there is a general gap in the data that makes it impossible to ensure the greatest value and effectiveness, and the best resource utilization of the fire service, in both current service provision and multi-year forecasts.

In emergency services, as in many other private and public entities, there are three kinds of data:

- Input data – the resources or assets that provide a service such as stations, apparatus, equipment, staff, type of staff (suppression staff, public education, prevention, training, support).
- Output data – information relating to performance such as response time, number of incidents, occupancies inspected, public education events, type of service provided, etc.
- Outcome data – the value factor such as detailed services rendered, measurement of result or consequence of providing the service.

Input and output data is usually adequately captured, although we have noted opportunities for improvement in this report. However, fire services – industry wide – experience a data gap with respect to outcome data. Outcome data, as its name suggests, is the information that would inform fire services and municipalities of the activities at an incident and enable communities to determine the functional, monetary, and social benefit (value) of response to certain call types, equipment that should be carried and in which trucks, vehicle type and size, staff requirements, training that should be undertaken, organizational structure, and answer many other questions that either cannot be satisfied currently without significant effort, or have not been asked because of a lack of awareness of the need. Outcome information, combined with response data and dispatch intake information gathered by the dispatch centre, will lead to being able to better match resources to fire service prevention and delivery.

Exhibit 3: Fire Service Call Sequence

Exhibit 3: Fire Service Call Sequence shows the five major steps in a fire service event. Information about steps 1, 2, and 4 is gathered via the computer aided dispatch system, but the most important aspect – that of what happened in step 3 – is only manually recorded in officers' notes after each incident. But the notes are in narrative form rather than tabular, which means they are not searchable and cannot be related to steps 1, 2, and 4 of the fire service call sequence. Therefore, there is no way of measuring the benefit and resource needs of various types of incidents.

It is also reasonable to expect senior officers' narratives to vary in detail and completion levels because each is prepared by different officers. This lack of associative information between the response activity, and service provided at each incident, compiled by incident type, means that the monetary and service value of the fire department cannot be objectively measured.

This lack of associative information between the response activity, and service provided at each incident, compiled by incident type, means that the monetary and service value of the fire department cannot be assessed.

The result of not having a deep enough level of data is that fire services, or a consulting team, cannot conduct a sufficient economic and value assessment of activities – without extensive manual effort – to determine where costs can be saved or avoided, or expenditures can be redirected.

Outcome information, in a tabular form, combined with a record of response[4] from the dispatch service for each vehicle that responds to an incident would enable the fire service to evaluate response times, the number of firefighters on board each truck, the assembly time of an adequate number of firefighters at an incident, or need for other fire trucks to be assigned to a

[4] A record of response should include an accurate time record of any movement by each responding fire vehicle. This includes, at minimum for each vehicle, time call received at the dispatch centre, time fire staff are notified of the incident, the time each vehicle left the fire station, the time each vehicle arrived at the incident, the time each vehicle departed the incident, the time each vehicle arrived back at the station. The dispatch provision contract may also include on scene activity and related time stamps that are reported by the incident commander to the dispatch centre.

structure fire. The alternative to having good data is often the continuation of time-honoured response practices that may not be providing the best value to the municipality.

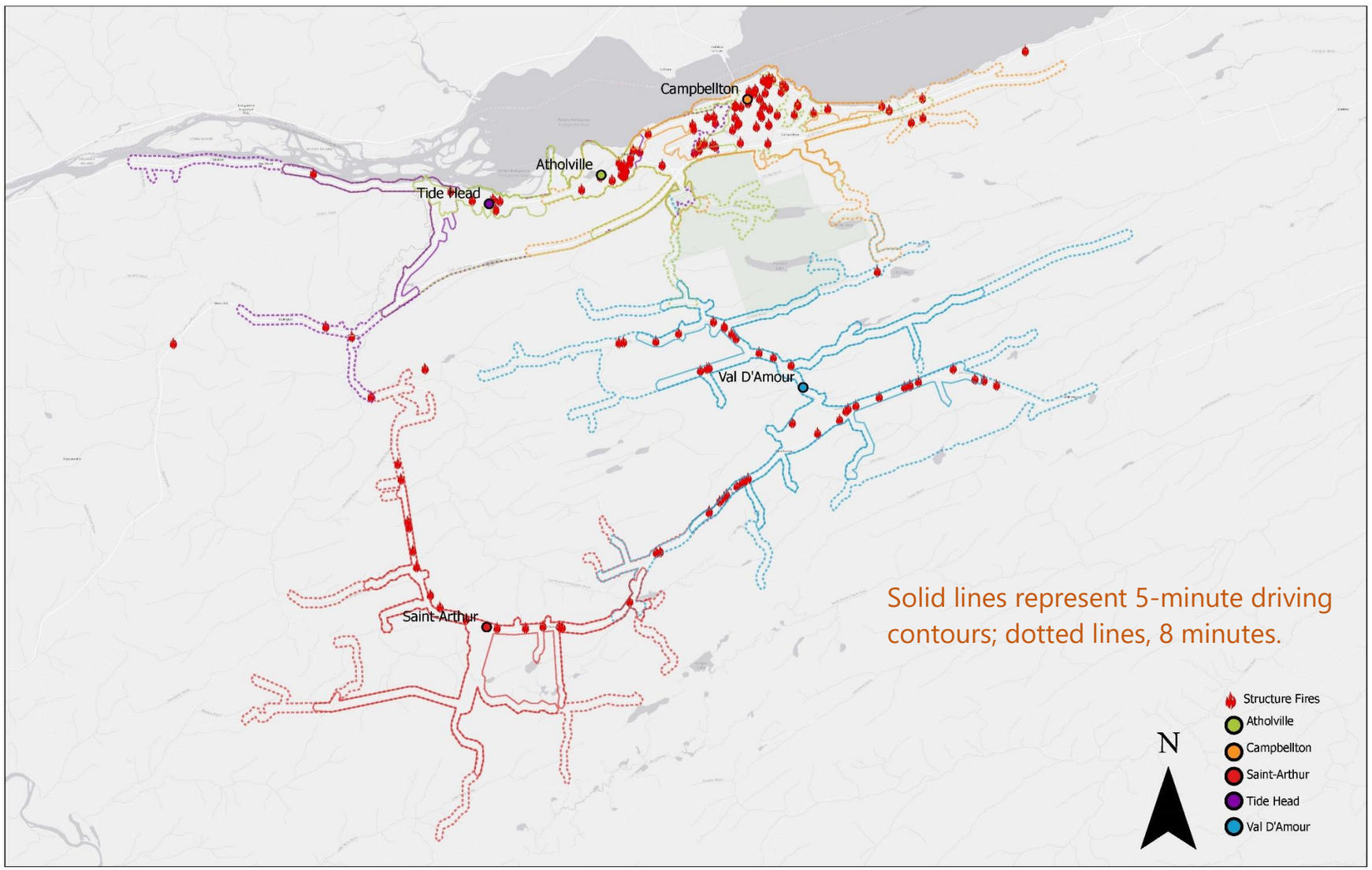
Developing an outcome database, relational to input and output data, would be the responsibility of the fire service. Currently, there are no commercial record management systems that capture outcome information although some vendors have expressed an openness to developing such a module. However, Campbellton Regional Community's fire service could, with help from the municipality's information technology department, develop an in-house outcome data record system that could work in concert with its existing FireQ record management software. Pomax will remain open to assist as part of the current contract.

Although there are some drawbacks to a locally developed system – particularly the inability to automatically receive incident response information from the dispatch provider in a database format, and the need to have a resource in the municipality with the skills to combine and extract data on an as-required basis for the fire service – a locally developed outcome record management system is an option.

Our recommendation is that the fire service should work with the municipality's information technology section to develop a spreadsheet-based outcome data system, which can be combined with data recorded in steps 1, 2, and 4 (Exhibit 3) resulting in a relational database.

We acknowledge the effort and resources required to create a local spreadsheet-based record management system and – whether local or as part of a commercial RMS – develop and maintain a tabular database outcome utility. Nevertheless, the effort and cost should be recovered within the first two to three years through cumulative efficiency and effectiveness while enabling the municipality to improve safety and reduce the frequency of fires and response requirements over 5 to 7 years.

Campbellton - 5 and 8 Minute Travel Time Showing 2018-2023 Structure Fires

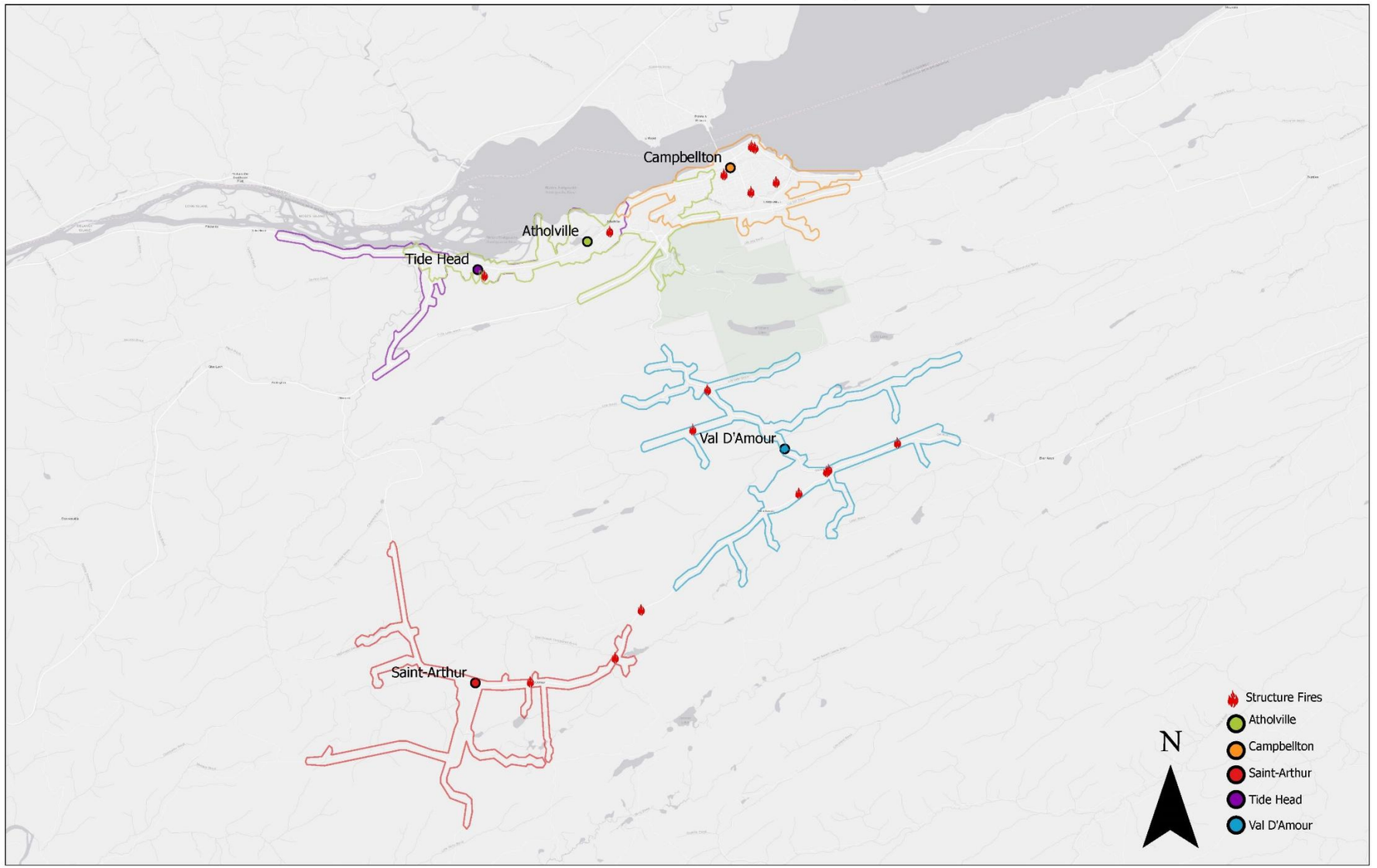


2.4 Structure Fire Locations in Campbellton Regional Community

This map shows the location of structure fires in the Campbellton Regional Community from 2018 to October of 2023. It's important to remember that this map shows all structure fires that were dispatched in the 5 ¾ years studied. Also, as we noted earlier when talking about Time on Scene data, some of the locations shown may not have turned out to be fires. However, all incidents are included as reported by the dispatch centre because of the uncertainty.

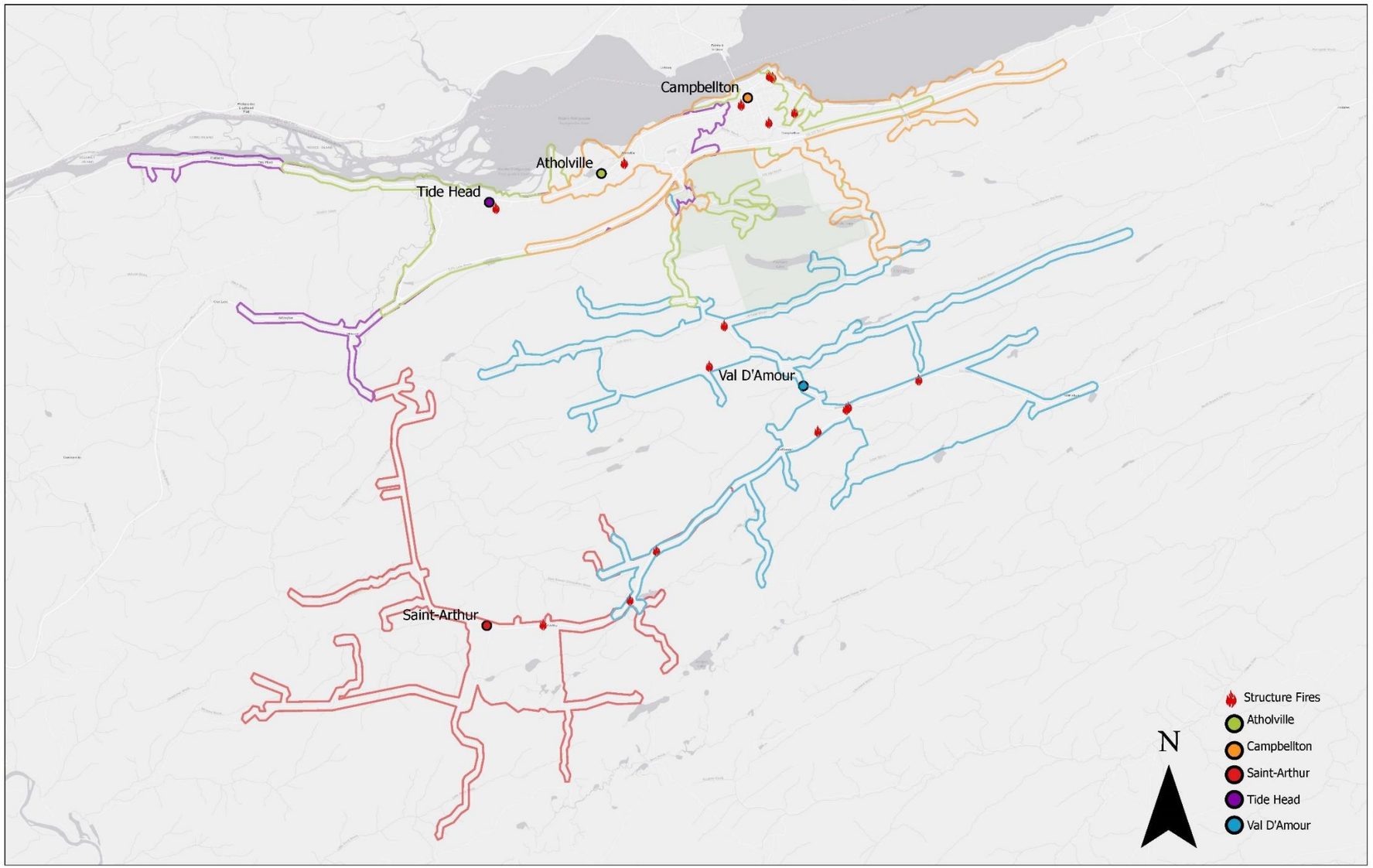
The colored contours depict road distance that can be traveled within five and eight minutes from each station, by an emergency vehicle, under normal circumstances. This is driving time only and does not include firefighter assembly time or preparation time at an event.

Campbellton - 5 Minute Travel Time showing 2023 Structure Fires



The maps on this page and the page following show structure fires in 2023 only and are for comparative purposes to the previous map which showed 5.75 years of structure fire responses. The contours on the first map indicate the area that can be covered within a five-minute drive, the second map is identical except shows an eight-minute drive time contour from each station.

Campbellton - 8 Minute Travel Time showing 2023 Structure Fires



Pomax has produced 16 other maps showing fires and five- and eight-minute travel times, similar to those seen in this section, for each year since 2018.

The maps will be provided to the municipality.

3 The Need for Suppression Resources at a Fire

3.1 How Many Firefighters are Needed to Fight a Fire?

This section addresses the number of firefighters needed to fight a fire in a single-family dwelling and is based on National Fire Protection Association[5] advice. NFPA is an organization widely considered by North American fire departments to offer 'best practice' standards, although it has less influence in other countries. That doesn't suggest that other countries have inferior standards, only that these jurisdictions have established alternate methods for determining human resources and asset distribution for emergencies. The most efficient and effective are data derived response plans, which is what this report recommends. We make this comment because full time, and to a lesser extent volunteer, firefighters will offer NFPA standards as performance objectives to strive for. However, meeting NFPA's advice is often challenging, particularly in rural and remote environments.

Table 2: NFPA Deployment Chart for Volunteer Fire Services (page 23) shows that the NFPA suggests a certain number of volunteer firefighters attend structure fire events within stated time frames, 80 to 90 percent of the time. But Table 2 also indicates that the NFPA standard recognizes that some zones, particularly rural and remote environments, will not be able to gather a large number of firefighters in a short time frame. In such cases, the senior fire officer on scene will determine which tasks can be performed until more firefighters arrive. The Campbellton area would fall into NFPA's suburban category; other locations in the new municipality would fall into the rural and, possibly, remote groupings.

Table 2: NFPA Deployment Chart for Volunteer Fire Services

Demand Zone*	**Demographics**	**Minimum Staffing Required****	**Response Time** (minutes) ***	**Meets Objective** (%)
Urban	>385 people /sq. km	15	9	90
Suburban	192 - 385 people /sq. km	10	10	80
Rural	< 192 people /sq. km	6	14	80
Remote	Travel distance > 12.87 km	4	Dependent on travel distance	90
Special Risk	Determined by Authority Having Jurisdiction (AHJ) (the municipality)	Determined by AHJ based on risk	Determined by AHJ	90

[5] The National Fire Prevention Association (NFPA) is a non-profit organization that promotes safety standards, education, training, and advocacy on fire and electrical-related hazards. Established in 1896 as a way to standardize the use of fire sprinkler systems, the NFPA's scope grew to include building design, rescue response, electrical codes, and other safety concerns.

Table 2: Continued

Activity	Minimum Firefighters on Scene	Initial Attack Time	Document Section	Meets Objective (%)
Interior Fire Suppression	4 *Section (4.6.1)*	2 minutes after assembly of necessary resources on scene	*4.3.4*	90
Sustained Firefighting Operations	Sufficient personnel, equipment and resources	AHJ Determined	*4.7*	AHJ Determined

Notes:
*A jurisdiction may have more than one demand zone.
** Minimum staffing includes members responding from the Authority Having Jurisdiction's (Campbellton) department and automatic aid.
*** Response time begins with the completion of dispatch notification and ends at the time interval shown in the table.

Section 4.6.4 of NFPA 1720 (standard for volunteer fire services) states, "Initial attack operations shall be organized to ensure that if, upon arrival at the emergency scene, initial attack personnel find an imminent life-threatening situation where immediate action could prevent the loss of life or serious injury, such action is permitted with less than four personnel when conducted in accordance with NFPA 1500."

Section 4.7.3 states, "The fire department shall be permitted to use established automatic aid or mutual aid agreements to comply with the requirements of Section 4.7" Section 4.7 identifies requirements to conduct sustained firefighting operations.

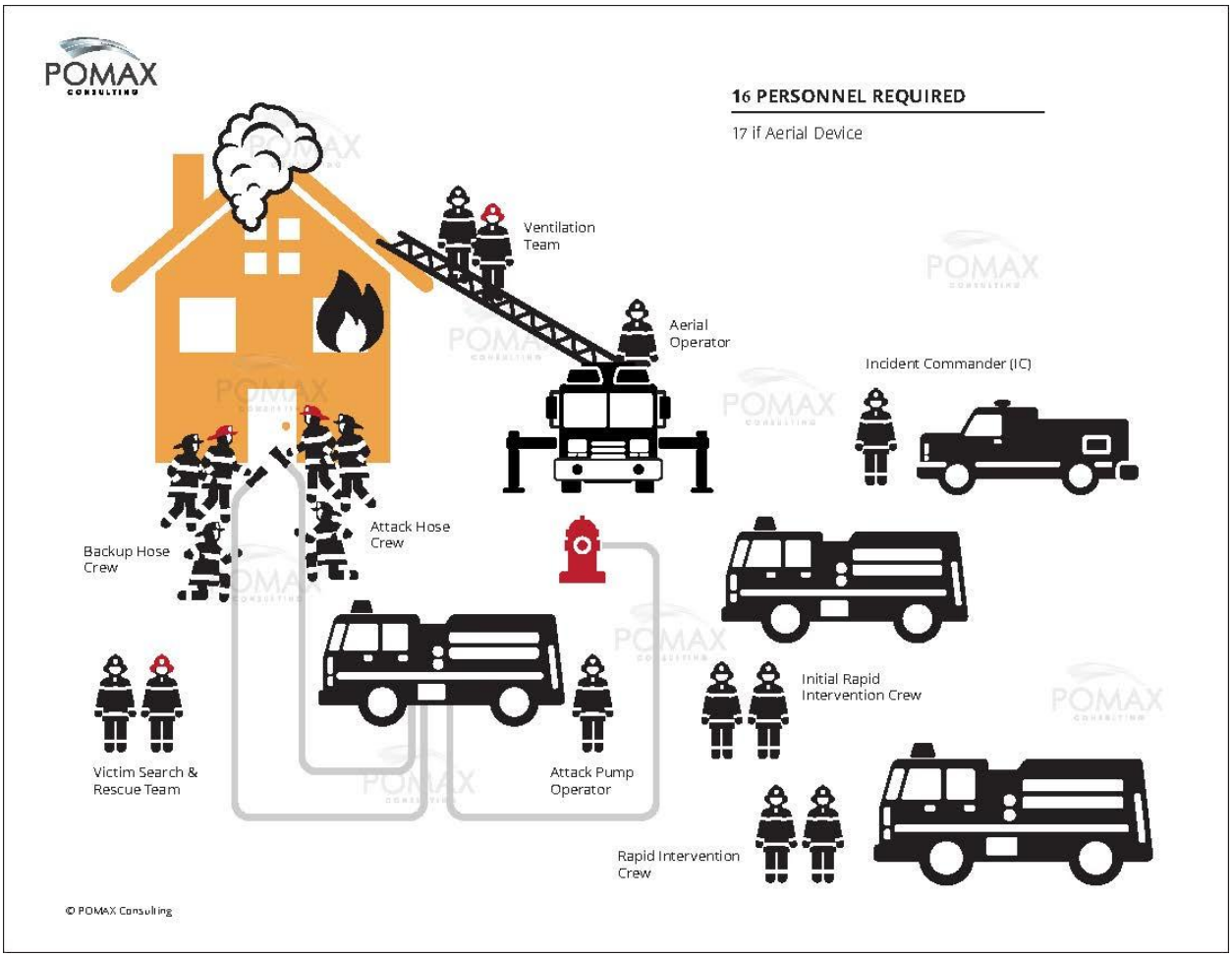
Exhibit 4 is a graphic that indicates the number of firefighters required to fulfill all the roles at a single-family dwelling fire. The illustration shows the work that takes place starting from about 13 minutes after a fire is detected.

The firefighters shown in Exhibit 4 include

- an incident commander to direct operations at the event;
- a hose crew, which is made up of two firefighters to handle the nozzle end of the hose because of water pressure, and one firefighter to ensure the flow to the nozzle continues and assist with moving and placing the hose as the firefighters at the nozzle move forward into the fire;
- a second hose crew, also made up of three people, who perform the same functions as the first hose crew;
- a pump operator to make sure the water supply remains at the right pressure to fight the fire;
- a victim search and rescue crew (two firefighters) to search the building for occupants;
- a ventilation team to exhaust smoke and gasses from the building allowing inside firefighters to operate more safely;
- a firefighter to operate the aerial apparatus if one is used;

- an initial rapid intervention crew who are prepared to rescue the first teams of firefighters if they become trapped, injured, or lost in the building; and
- a rapid intervention crew to assist with rescues, if needed, and because there may be two or more firefighting teams in the building.

Exhibit 4: How many Firefighters are Needed to Fight a Fire?



Even though the need for duties as shown in Exhibit 4 may vary depending on the fire – for example, if there are no victims, firefighters for victim search and rescue crew may not be required – the incident commander can assign staff to other duties such as tracking which firefighters are entering and leaving the building, acting as relief for the first group of firefighters who were deployed into the building, or staffing another hose.

The question has arisen as to how the NFPA can suggest that up to 17 firefighters are required for a house fire (Exhibit 4) but as few as four or six are acceptable in rural and remote environments (Table 2). The variance reflects a recognition that some environments with a low population base will find it difficult to attract or assemble the same number of firefighters as areas with a higher population. It isn't intended to suggest that more firefighters would not be a greater benefit or increase safety.

4 Working with the Dispatch Centres to Refine Response and Resource Commitment

There are indications in the median time on scene information that the Regional Community may be able to decrease the frequency of responses, and the number of trucks responding, without increasing risk to the population.

During the period studied, CRC responded to 2,455 incidents although only 1,297 had sufficient information for analytic purposes. 2,643 vehicles were sent to those 1,297 incidents resulting in an average of two vehicles sent to each event. There are data mining methods that could provide information resulting in reduced responses, thereby substantially decreasing firefighter call in, wear and tear on vehicles, and costs.

For example, CRC could probably refine its response policies if it could extract from the data the number of times that firefighters and trucks were sent to an incident only to find out fire wasn't needed. This includes being dispatched and cancelled, arriving at a medical incident to find that an ambulance had arrived prior to or within minutes of the fire truck, a traffic collision was without injuries or entrapment, or responding to automatic alarms which have an industry wide, 95% to 98% false rate.

In fact, we found 371 alarm incidents in the 2018 – 2024 period, two of which were categorized as turning out to be structure fires. That's a 99.46% false alarm rate. And the two incidents that were reported as resulting in structure fires had only one truck sent to each incident, which causes us to question whether they were structure fires, or the severity. We also don't know if the alarms were quickly followed by telephone calls, from people near the scene, confirming a fire.

Automatic alarms are a useful case study since they represent almost 30% of responses[6] in the Regional Community, followed by traffic incidents at 19%, miscellaneous events at 18%, and then fire at 15%.

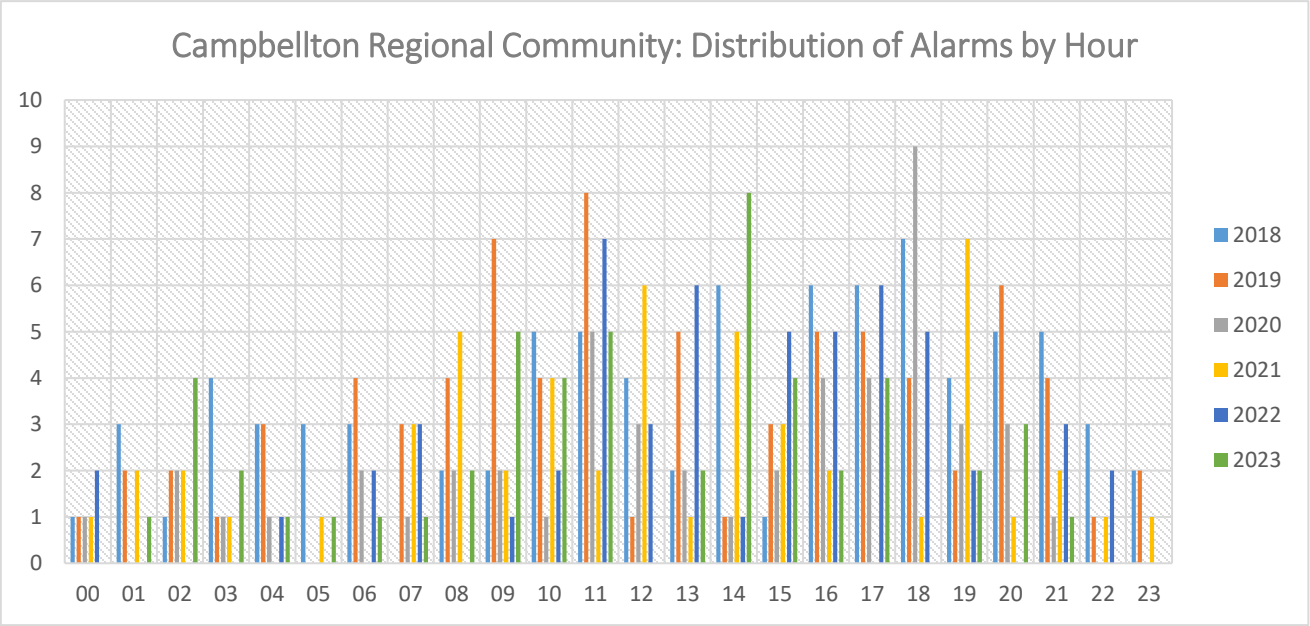
Automatic alarms have an industry-wide false rate of 95% to 98% with most fire services reporting 98% or greater as false. Some fire services, including a few of Pomax's clients in Canada, have adopted a scaled approach to automatic alarms such as one truck sent in emergency response mode while a second follows without lights and siren unless there is confirmation of a fire. One of Pomax's former clients sends an officer in a pickup truck or car to alarms unless there is confirmation of a fire. In some locations in the United Kingdom, responses to alarms do not occur without what is called a 'challenge'. This means that, unless there is confirmation of a fire at the time of an automatic alarm, a call taker or dispatcher will telephone

[6] 587 vehicles dispatched to 373 automatic alarms.

a registered contact person to confirm the nature of the alarm. Exceptions are made during some hours when a merchant or industry is not open for business, or no contact can be reached.

Data reveals that automatic alarms in Campbellton region are false over 99.4% of the time and, depending on what kind of response approach is decided upon, calls could be reduced by more than 60 a year and truck responses by just under 100 annually.

We know from the data examined that the majority of automatic alarms occur during business or retail hours, and many are attributable to errors during alarm testing or when activating or deactivating alarms.



The same analysis can be applied to other non-critical, non-time sensitive incident types such as traffic collisions and some medical events. More than 75% of responses fall into the non-critical, non-time sensitive category.

The frequency of these non-critical call outs can be reduced through two activities:

1. Working with 911-police, paramedic services, and the fire dispatch centre to hone call taking, dispatch, and call out procedures, and
2. using analytics to refine response methods (as already noted).

Better analytics and a reduced number of dispatches offers opportunities to

- reduce firefighter turnout and decrease staffing costs,
- diminish wear, tear, and repair costs to trucks;
- help determine, in future, the size and type of trucks required, and the limits of equipment that each truck needs to carry.

From a call taking and dispatch perspective, the fire service can be activated in several ways (the following examples are not intended to be all-encompassing):

- The incident may be a fire or other event such as water rescue, carbon monoxide, smoke or fire alarm, etc. for which the fire service is the primary response.
- Ambulance New Brunswick determines the fire department might be needed for assistance and requests fire. Such calls include cardiac arrest, unconscious patients, entrapment, serious traffic collisions, and events where paramedic services may require help gaining access to a patient.
- The police service may determine that fire is required for an incident such as a motor vehicle collision, drowning, or rescue.
- An agreement may be in place, such as *New Brunswick 911 Appendix E* within which fire departments opt into being dispatched to traffic accidents if the caller states key words to the call taker[7] (see Appendix A, NB 911 Motor Vehicle Collision Operating Directives).
    - These key words include *smoke, fire, flipped or rolled over, trapped, vehicle in water, airbags deployed, spill, chemicals, dangerous goods*. Although some incidents require fire department presence, few do, and few are time sensitive resulting in the over deployment of fire services.
        i. As an example, Transport Canada indicates that airbags deploy at a force equivalent to a vehicle colliding with a wall at between 13-23 km/h. Fire department are unlikely to be needed for such a low impact incident. So, should 'airbags deployed' be an arbiter for dispatching fire departments or should it be the severity of an accident?
    - To our knowledge, those keywords that precipitate the dispatch of fire trucks to collisions have not been assessed as to whether they are positively correlated with entrapment. In other words what is the frequency of a false positive assumption based on the key words? We recommend, later in this section, refining information gathering and dispatch techniques at the communications centre to determine the frequency and circumstances for dispatching the fire service to traffic incidents.
        i. An International of Academies Emergency Dispatch research paper[8] published in Annals of Emergency Dispatch & Response, aimed to determine the accuracy of current 911 practices in recognizing pins and entrapments resulting from motor vehicle incidents. The conclusion was that the question "Is anyone pinned (trapped)?"

[7] It has become normal practice, in many jurisdictions, to send firefighters to incidents such as traffic collisions, along with police and paramedic services, even though there isn't a confirmation of extrication required. Entrapment is rare but firefighters are also called out for the purpose of blocking roads or cleaning automotive fluids from roadways. Each municipality has to make its own decision as to the value of such services by the fire department, but the important point is that taking time to gather more information at the time of call taking may assist to reduce fire department deployment and alleviate financial expenditures.

[8] Predicting the Need for Extrication in Traffic Accidents Reported to 911: Is Anyone Pinned/Trapped? *Chris Davis, EMD-I; Paige Dodson, MD, MPH, FAAFP; Chad Pore, MS, Paramedic; Sirilakshmi Sangaraju, MS; Meghan Broadbent, MS; Greg Scott, MBA, EMD-Q-I; Isabel Gardett, PhD; Christopher Olola, PhD.*

is a better indicator of determining if extrication is required than other key word usage. This study also found that callers overestimated entrapment by about 30%.

ii. Another study in the Syracuse area of New York State[9], published in the American Journal of Emergency Medicine concluded,

> *During [the] study period, specialized equipment and personnel were rarely needed for patient extrication from MVCs in this municipality. At no time was fire suppression required. This study suggests the potential hazard imposed by routine FD response to MVCs for purposes of extrication or fire suppression may not be warranted in this emergency response system. A prospective study, including a cost analysis, should be undertaken to further clarify the role of FD response to MVCs.*

We want to be clear that the results of the studies noted above may not reflect the realities in the Campbellton region, only that these and other reputable studies should cause inquisitiveness for the new municipality to assess its fire response practices to determine their efficiency, effectiveness, and validity.

We recommend the following techniques to refine dispatch procedures and improve fire service resource value.

1. In concert with the recommendations below, the fire department should seek peer reviewed studies from scientific journals or other impartial publications to either confirm or question existing response methods.
    a. There are large number of journal articles that examine the need, or absence of evidence, for response by fire departments to a broad number of call types. For example, Pomax has over 700 peer reviewed journal articles about the operation and response of emergency services, mostly fire related. By familiarizing itself with similar journal articles the fire department can examine current responses that could be adjusted thereby increasing value and lowering fire service operational costs, and achieve guidance as to which actions should be reviewed with the dispatch centre.
2. Create a joint dispatch service planning group – possibly including other fire departments dispatched by the same communications centre – for the purpose of reviewing selected incidents and refining dispatch information gathering and dispatch techniques.
3. The fire service should review a sample of emergency calls, including listening to the dispatch centre's recordings from the moment a call is received at the 9-1-1 centre, or fire dispatch, until scene arrival and incident assessment. This is quality improvement

[9] Necessity of Fire Department Response to the Scene of Motor Vehicle Crashes; Deborah L. Funk, MD, NREMT-P, Jonathan F. Politis, BA, NREMT-P, Mara Earlean, MD, And Edward T. Dickinson, Md, NREMT-P; Can emergency medical dispatch systems safely reduce first-responder call volume? Prehospital Emergency Care, David C Cone, Nicholas Galante, Donald S MacMillan.

best practice. Campbellton region responds to approximately a call per day on average so almost all calls could be reviewed, but a minimum of 10 events of all types should be appraised monthly.

   a. Review the recording to see what information was received by the call taker and the effort made to determine the full nature of the call so that effective and efficient resources are sent to incidents.
   b. Determine how the deployment of assets could be reevaluated thereby resulting in greater efficiency and reduced risk to firefighters and the public from large fire trucks responding in emergency mode.
   c. Work with 9-1-1, police, and paramedic services' dispatch centres to recognize information patterns at the call-taking stage to eventually increase efficiency of call-taking and dispatch processes.

4. Review outcome data (officers' notes) manually until a record management system is developed sufficiently to record on-scene activity in a relational database.
   a. Equate information gathered at the call taking stage with as-found information at the scene for congruency.
   b. Work with the dispatch centres (9-1-1, police, fire, paramedic services) to find techniques for querying callers so that information gathered more closely aligns with 'as found' on scene.
5. Except in cases such as confirmed fires, confirmed cardiac arrest, and a few other emergencies where minutes count, the dispatch centre should take time to obtain additional information which may reduce the number of times firefighters are dispatched.

Taking these steps over the next two to three years, and comparing caller information with outcome data, will offer an opportunity to refine resource commitment, reduce dispatches, and reserve assets for more urgent incidents.

5 Current Fire Stations and Apparatus

Pomax visited the five fire stations in March of 2024. Fire Station Assessment Forms were completed for each station and provided to the Regional Community. Brief interviews were conducted with the Chiefs at each station (Assistant Chief for Val-D'Amour), and apparatus, stations, and equipment were reviewed.

We found that apparatus (the vehicles) and fire service equipment mostly met the utilization and safety needs of the departments; however, many equipment items, including self-contained breathing apparatus, will be nearing the end of useful life within the next few years. Some apparatus and rescue trucks are well beyond acceptable useful service life.

The fire stations are generally adequate but in need of upgrades; the notable exception is the Saint-Arthur station. This station has significant safety/maintenance issues including an outdoor wooden stairwell that, at the time, was rotted and taped off with yellow tape. The upstairs emergency door exits onto this stairway. We understand that the municipality has already taken action to resolve the stairway and other issues at this location, including correcting some electrical needs and equipping exits with signs and commercial panic hardware.

None of the fire stations have vehicle exhaust removal systems (removal of diesel exhaust fumes and particulates). The Campbellton area station has a home-made system that was built by firefighters to be used if the trucks are running in the garage, but they are not commercial automatic systems[10] therefore, not certified, tested or inspected.

[10] Commercial automatic systems operate when the truck engine is started, and a sensor automatically switches on the exhaust fan. All toxic exhaust soot and gases are drawn through a high-temperature sealed ductwork hose and are dispersed outside the building. The system disconnects automatically as a truck departs the bay and the fan shuts down after a delay. (From AQC Dust Collecting Systems. There are other manufacturers.)

After the March 2024 visit our recommendation was to close the Saint-Arthur station while safety renovations and upgrades to the building could be affected. This recommendation assumed that a temporary building is available to house the trucks and equipment. We understand that the municipality has been able to effect repairs without closing the station.

Although documentation wasn't readily available for verification, each station seems to be complying with pump, gear, self-contained breathing apparatus, and ladder testing requirements. Fire hose is not tested on a regular basis.

Other recommendations with regard to the stations can be found in Section 7 Summary and Considerations.

6 Fire Prevention, Public Education, Firefighter Training

6.1 Fire Prevention and Public Education

Fire prevention and public education programs are considered to be vitally important in reducing fire risk. Unfortunately, there is no evidence that the standard practice for public education and prevention[11] programs work, other than the installation and maintenance of smoke alarms. And smoke alarms are not a prevention tool, they are an early notification instrument for a fire situation, although there is evidence that smoke alarms reduce the risk of injury and death and property damage. On the other hand, there is no evidence that standard fire prevention activity does not reduce the number of structure fire events.

A study published in Fire Technology and authored by Marcus Runefors and Finn Nilson[12] discusses that the risk of fatal residential fires is known to be differentiated by sociodemographic factors, yet prevention methods are introduced generally in a population, thereby possibly affecting the effectiveness of these interventions (negatively). The conclusion of the study was that

> *… one solution does not work for all. Rather, fire prevention interventions need to be specifically chosen for each individual depending upon the potential benefit and impact of an intervention. Currently, a "one size fits all" approach is commonly seen in fire prevention. This study shows that this needs to change in order for fire prevention interventions to become as effective as possible.*

[11] We separate legislatively required fire inspections (compliance) from public prevention and public education efforts. Compliance inspections, required by legislation, may prevent fires in some cases – as in inspecting commercial kitchens, laundries etc. thereby possibly preventing a fire – whereas public prevention and education programs usually entail door knocking, handing out pamphlets, public displays during emergency services weeks, and social media postings. There is no evidence that such programs make a difference in reducing the frequency of fires. However, home safety checks (such as programs in the United Kingdom [UK]) where firefighters are invited into a residence and provide fire safety advice based on the contents and specific risk factors have been cited in the UK as contributing to the reduction of fires.
A home safety fire check usually includes a general safety check (e.g. identifying flammable electronics or liquids, location of candles, possession of fire extinguishers, and fire blankets), elementary fire and safety education, and smoke alarm control or installation.

[12] Marcus Runefors, Division of Fire Safety Engineering, Lund University, Lund, Sweden; Finn Nilson, Department of Political, Historical, Religious and Cultural Studies, Karlstad University, Karlstad, Sweden and Centre for Societal Risk Research, Karlstad University, Karlstad, Sweden

Another study published in the Journal of Safety Research[13] concluded that home safety fire checks by suppression firefighters in the study area

> *… demonstrate that fires and developed fires decrease by a maximum of approximately 6% and 8% per year (assuming 100% causality) and that the intervention has positive economic effects, with the benefits estimated to be maximum 8–11 times higher than the costs.*

There are other studies from the United Kingdom and New Zealand that conclude that fire prevention efforts must be targeted to individuals or, at least, demographic groups and those prevention techniques need to be personal to be effective.

We are aware that part of the Fire Chief's responsibility is fire prevention and public education. Assistance is received from on duty firefighters if the prevention and education efforts are held at, or within three minutes of, the fire station; for example, school class tours of the station and equipment. Nevertheless, the majority of time, the Chief is solely responsible for ensuring education and prevention activities. Our conclusion is that prevention and education activity is not functioning at optimum levels because of the Chief's workload and organizational design of the fire department. Options are discussed in Section 7.

6.2 Should Prevention and Education Staff be Firefighters?

[13] Björn Sund, Carl Bonander, Niklas Jakobsson, Henrik Jaldell; Economics, Karlstad Business School, Karlstad University, Karlstad, Sweden; Institute of Medicine, Health Metrics Unit, University of Gothenburg, Sweden; Centre for Public Safety, Karlstad University, Sweden; Swedish Civil Contingencies Agency, Sweden.

6.3 Firefighter Training

Pomax was not able to observe training or discuss training programs at each fire station. Firefighter training is important because firefighters don't attend a significant number of call types that require teamwork and equipment usage such as fires, extrications, water rescues, and others. Training provides the opportunity to maintain familiarity with equipment and techniques to ensure a safer work environment and possibly improve outcome for victims.

Training is provided locally at each station which means there is some unavoidable variance in methodology and degree of training. A more centralized method of training might offer improved uniformity and knowledge sharing.

A full time training officer would be crucial to accomplishing the required consistency (please see Section 7.5 Full Time Staff).

Training suggestions include, for all staff who do not have the following qualifications[14]:

(Not a complete list; examples only)

- NFPA 1006 water rescue
- Pump operations
- Fire inspector 1
- Fire life safety educator
- Investigator 1
- Community risk assessment
- Commercial cooking
- Fire code
- Hydrant testing (where applicable)
- Emergency response driving
- NFPA 1002 pump operations
- Advanced hose operations
- Drafting from water sources
- Wildland firefighting
- Air brake refresher with mechanic
- Auto extrication training
- Continuing education for officers and staff
- Harassment training
- Leadership training

[14] These are training suggestions for full and volunteer staff who have not completed the courses already. We are not suggesting that all staff have all courses; there can be a distribution of expertise throughout the firefighting ranks.

7 Summary and Considerations

- Data provided in this report show that the five fire stations are not busy. The Campbellton area station is the most active.
- During the 5.75-year study period the fire stations, together, averaged approximately 5 incidents a week.
- 30% of incidents were automatic alarms; 19% were traffic collisions; 18% miscellaneous; and 15% were structure fires making up 80% of overall calls.
- Four stations, Atholville, Saint-Arthur, Val D'Amour, and Tide Head are fully volunteer stations. Campbellton area has a full time Chief and four full time firefighters. The full-time firefighters work rotating 10- and 14-hour shifts enabling one person to be on duty 24 hours a day.

7.1 Record Keeping

- We are only moderately confident in the data provided to us. We started with 2,455 incidents recorded by Bathurst dispatch. After removing the activity of the administration car 1,938 incidents remained. We then removed records that had missing times – which means they had insufficient data for measurement – resulting in 1,297 events.
- Median response times to structure fires for all stations are acceptable considering the geography and distance traveled.
- Outcome data is not available within the fire service's record system. This is a prevalent issue across North America, therefore not unique to the Regional Community.
    - This lack of information makes it difficult to measure the value of fire department activity.
    - The alternative to having good data is often the continuation of practices that, although time-honoured, may not be providing the best value to the municipality. In other words, multiple vehicles might be sent to incidents, on the basis of "better safe than sorry" or "I remember a time when …", that almost never require more than one vehicle, or don't even require the presence of firefighters.
        i. Good data gathering practices and robust analysis will provide accurate guidance as to what kind of resources are required and when.
    - This lack of associative information
    - between the response activity, and service provided at each incident, compiled by incident type, means that the monetary and service value of the fire department cannot be assessed.
- There are indications in the median time on scene information that the Regional Community may be able to decrease the frequency of responses, and the number of trucks responding, without increasing risk to the population.

7.1.1 The Number of Incidents is Being Overcounted

We were puzzled by the high number of structure fires in each of the municipalities, particularly Val D'Amour[15]. Eventually, we resorted to manually counting and reviewing each structure fire and found that some fires were being double and triple counted, and two were counted four times. The same practice occurs with other call types, but structure fire responses are most obvious because multiple vehicles are often dispatched.

We have discussed the details with the Chief Administrative Officer and recommend that the fire department should work with the Bathurst Dispatch Centre to revise the way incidents are recorded.

Table 3 indicates the number of structure fires that occurred, by year, to the best of our calculations, after eliminating the overcounts. 2023 represents 10 months of data. We remain concerned by the elevated number of structure fires in some years, particularly in Val D'Amour.

Table 3: Number of Structure Fires by Station

	2018	2019	2020	2021	2022	2023
Atholville	3	9	2	0	2	1
Campbellton	13	3	13	8	8	3
St. Arthur	1	4	1	0	1	3
Tide Head	4	1	2	1	2	1
Val D'Amour	11	6	1	2	5	6

Table 4 offers a comparison of fires per capita for several municipalities. "Per Capita" is presented as the percentage of population that experienced a structure based on the **average annual fires** for the years shown. The years for which data are displayed depend on when data were gathered.

Table 4: Municipal Comparator - Percentage of Population That Experienced a Structure Fire

	Population	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total	Per Capita
Campbellton, NB	11,986				32	23	19	11	18	14		117	0.16%
Saint John, NB	69,895	60	57	66	74	66	52	57	59			491	0.09%
North Dundas, ON	11,304					9	9	10	9	13		50	0.09%
Central Elgin, ON	13,746					5	8	6	9	9	8	45	0.05%
Cornwall, ON	47,845				23	18	32	25	32	20		150	0.05%
Lincoln, ON	25,719		19	9	8	10	7	16				69	0.04%
Halton Hills, ON	62,951					21	19	27	18	12	27	124	0.03%
Grimsby, ON	28,883			4	15	7	8	10				44	0.03%
Clarington, ON	92,013	25	15	19	15	15	15					104	0.02%

[15] Some structure fires in the Val D'Amour area have been attributed to arson although specific numbers have not been confirmed. There was a decrease in fires in 2020 and 2021 but reported structure fires showed an increase in 2022 and 2023. The number of fires reported are significantly abnormal for the population base.

7.2 Fire Incidents and Risk

The most appropriate way to measure risk in a community is through structure fire and other time sensitive event history. There are several definitions of risk; a commonly accepted one is *probability x impact = risk*. And, while there are risks in the community other than fire; for example, water rescue, the probability or frequency is low. Some incidents which have a greater probability, like traffic collisions, usually have low impact[16]. There are also many elements to be considered within the *impact* component of risk such as

- Who or what does the impact affect?
  - Is it property or personal; individual or to a group or community; short term or extended; is the risk to the public or firefighters or both?
  - Do events with a high probability of false positives, such as alarms and traffic collisions, where multiple trucks are deployed as a precautionary measure ("just in case"), create a comparable or greater level of risk due to the operation of large vehicles at high speeds or volunteers rushing to the fire station or incident site, compared to taking additional time at the dispatch center to gather information that might lead to a more balanced response? It is important to note that there are few types of incidents where minutes or seconds are critical.

Risk is dynamic and we could add a 20- or 30-page section to this report addressing the theory and application of risk. But, in the case of structure fires, the almost six-year history of incidents tells us that the probability of structure fires is low in Atholville, Saint-Arthur, and Tide Head; low to moderate for Campbellton area; and questionable for Val D'Amour because the community appears to have a high number of fires for the population.

Understanding "risk' is important because Campbellton Regional Council will have to decide on a level of risk acceptable to the new municipality which will then determine the fire assets and resources that should be in place. Pomax has made recommendations strongly predicated on available data but Council will have to determine the 'social construct' aspect of risk, which is explained in the following paragraphs.

The following excerpt about risk is from: Disaster Theory, David Etkin, Professor, York University, Faculty of Liberal Arts and Professional Studies.

> *The first thing to know about the term risk is that it means different things to different people; there is no universal agreement on its meaning. Any serious*

[16] 1) Necessity of Fire Department Response to the Scene of Motor Vehicle Crashes; Deborah L. Funk, MD, NREMT-P, Jonathan F. Politis, BA, NREMT-P, Mara Earlean, MD, And Edward T. Dickinson, Md, NREMT-P;
2) Can emergency medical dispatch systems safely reduce first-responder call volume? Prehosp Emergency Care, David C Cone, Nicholas Galante, Donald S MacMillan;
3) Predicting the Need for Extrication in Traffic Accidents Reported to 911: Is Anyone Pinned/Trapped? *Chris Davis, EMD-I; Paige Dodson, MD, MPH, FAAFP; Chad Pore, MS, Paramedic; Sirilakshmi Sangaraju, MS; Meghan Broadbent, MS; Greg Scott, MBA, EMD-Q-I; Isabel Gardett, PhD; Christopher Olola, PhD*

conversation about risk must therefore begin with a common understanding of its definition. It matters less which definition is used than that we agree to a particular usage and move forward.

(Also see publications by Paul Slovic, Richard H. Thaler, Carl S. Sunstein, Amos Tversky, Daniel Kahneman [two of whom are Nobel Prize winners] that address behavioral economics and risk and upon which David Etkin's statement is based).

Returning to David Etkin's book on Disaster Theory, the overview description for Chapter 3, Disaster Risk, states

Although having the appearance of objectivity, risk is best viewed as being largely socially constructed. There is no optimum risk assessment or management strategy; context determines which approach is most suitable. Also, there are many issues or traps that can result in poor or biased risk estimations. These include adherence to specific worldviews, heuristics[17], bounded rationality[18], emotions, and values.

Professor Etkins statement on the social construct of risk, which is heavily based on risk and behavioral economics work by Slovic, Thaler, Sunstein, Tversky, and Kahneman, is important to Councilors because Council will have to make a decision as to accepting Pomax's recommendations, based on how we have determined 'risk' (probability and impact), or whether council determines that an alternative to the recommendations is satisfactory.

Risk formulas are described in several ways (e.g., *Risk = Hazard × Vulnerability)*. For the purpose of this report, we will use Probability x Impact = Risk.

There are few true life-threatening events where minutes make a difference and almost none where seconds count. There is an abundance of research literature from scientific, safety, medical, fire engineering, and other peer-reviewed journals (a few of which we have referenced in this document) that support the statement of the previous sentence. But there are some event types where response time could make a difference. These include fires, cardiac or respiratory arrest, carbon monoxide incidents where occupants remain in the building, and leaks such as chlorine or other noxious fumes. Fortunately, such events are rare and, based on the data we have available data, have the potential to occur no more than 50 times a year – but those might be considered high risk incidents.

Risk is *probability x impact*, and both can be positively affected. Although we often refer to buildings of certain types (schools, hospitals, care homes) as being high risk, they usually aren't,

[17] Mental shortcuts that can facilitate problem-solving and probability judgments; generalizations; or rules-of-thumb, which reduce cognitive load.

[18] A decision that will be good enough, rather than the best possible; based on a false sense of rationality because we do not have all the information available.

because the probability of an incident is usually low although the impact of an occurrence can be high. There could be a component of the building – for example, a kitchen area that isn't adequately maintained, a heating plant that is not kept to up to a safe standard, the lack of a fire sprinkler system, or missed fire inspections – that could add to risk. But assuming adequate and timely inspections, and the availability of fire prevention resources to complete and follow up inspections, probability could be diminished. Prevention resources include firefighters, not just staff designated as fire prevention personnel.

The more detail that is known about an occupancy, the more accurate a fire department can be in determining risk. The less that is known about individual occupancies, the more generalized is a risk assessment, which results in the tendency to assign a higher level of risk than actual.

Fire departments depend on inspections and investigations, augmented with community education, to make the public aware of fire risk and impact. In full time fire services, firefighters sometimes assist prevention and inspections by undertaking home and business safety checks – effectively going door-to-door making occupants aware of fire safety principles, leaving information pamphlets, checking for open passage doors in apartments, confirming that fire extinguishers are certified, etc. Firefighters can also use these occasions to inform – what are called – fire pre-plans, which include building layouts, where to stage fire trucks in case of a fire, hydrant locations and capacity, or other water sources. In a full-time fire service, firefighters can be assigned to such roles as part of regular duties, but it may be more difficult to persuade volunteers to offer their time for this purpose.

7.3 Organization of the Fire Department

Prior to Local Governance Reform there were five fire departments in what is now the new Campbellton Regional Community.

- Atholville
- Campbellton
- Tide Head
- Saint Arthur
- Val D'Amour

If Pomax was conducting this fire master plan study in a 'greenfield' environment, in other words, a municipality where no fire stations exist, and was tasked with determining where to locate them, we would not recommend stations other than one in Campbellton area. An exception may be a volunteer service in Val D'Amour depending upon the outcome of further review of the apparently high volume of fires relative to the population.

The reasons for this conclusion include

- Data shows that the probability of structure fires is low.

- The capital and operating cost of a fire station, trucks, equipping firefighters, and training is high compared to the frequency of need.
- In some locations, such as Tide Head and Atholville, structure fires have averaged every two months to four months respectively and the Campbellton area fire station is no more than a five-to-11-minute drive time.

However, the drive time to Val D'Amour and Saint-Arthur areas range from 12 to 20 minutes respectively from Campbellton area station, and 14 minutes to Saint-Arthur from Tide Head. And winter travel in the Val D'Amour and Saint-Arthur areas may be extended.

The considerations for determining locations of fire stations, while primarily the frequency of structure fires, includes distance travelled, response time, and sometimes, terrain and weather.

If a recommendation could be made solely on statistics, it would be that one fire station in Campbellton would suffice the Regional Community (depending upon the outcome of confirming the number of structure fires in the Val D'Amour area). However, taking into account other factors such as distance, terrain, and weather, we recommend that the Regional Community consider decommissioning the Atholville station, at minimum, and preferably the Tide Head station. Apparatus and equipment at the two stations could be redistributed and surplus equipment sold or donated.

Volunteers at the Atholville and Tide Head stations should be welcomed as volunteers at Campbellton area or another station within the Regional Community.

7.3.1 Station and Apparatus Resources

Recommending the closure of fire stations may result in concern from the public and firefighters because it is natural not to accept the idea of losing something that exists, no matter what the data suggests.

If we consider the number of stations from a different perspective; that is, if none existed and we recommended establishing two new stations in, or near, Tide Head and Atholville on the basis of a structure fire occurring every two months on average, even though the new fire stations would be within a five- and eleven-minute drive of the Campbellton area fire station, there might be some skepticism expressed about the need. The reason for doubt would likely be because of the cost of operating fire stations to serve an average of six structure fires per year. That cost would include four pumper trucks at an estimated cost of $300,000 to $750,000 for used units and two rescue trucks at a cost of $175,000 to $500,000, also used. Add in the cost of equipping each truck at a conservative estimate of $40,000, resulting in another $320,000. There would be additional expenditures for recruiting and equipping volunteers (estimated by some clients as around $10,000 per volunteer) which means that the cost of establishing and maintaining a volunteer fire service would be in the millions.

Some would suggest that the trucks, equipment, buildings, supplies, and volunteers already exist in Atholville and Tide Head so there is no additional cost. But there is; it just isn't spent in a lump sum. Using Tide Head as an example, the station has a 2017 pumper but it also has a 1997 pumper, which is beyond its useful life, and a 2000 Rescue truck which is 24 years old. Both should be replaced soon, which means the costs estimated above will need to be considered for Tide Head and other stations. The same principle applies to equipment at the two stations although the costs could be spread over several years.

We aren't recommending the closure of these two stations because of upcoming or imminent costs only. We make this recommendation because the data indicates that based on the low number of incidents in and around the two locations, and the proximity of the Campbellton area station, the stations aren't required. Our recommendation is based on data and risk analysis whereas Council will have to consider the social construct component of risk while considering this recommendation.

If the Regional Community decides to leave the fire stations in place, temporarily or permanently, we recommend rationalizing the apparatus and equipment at the two stations. Atholville and Tide Head stations are approximately four minutes apart, and the Campbellton area station is five minutes from Atholville. There are three apparatus housed in each of the Atholville and Tide Head stations. But one pumper at each station would be satisfactory since they would back up each other, and the rescue vehicle from Campbellton area is five to nine minutes away[19]. Rescue trucks are not required on scene as first in vehicles. We envision a reduction of at least four fire trucks in the new municipality even if council decides not to close stations. This avoids future replacement costs of $300,000 to $750,000 per vehicle plus equipment.

Atholville has a relatively modern fleet of trucks: a 2014 and 2018 pumper and a 2018 Rescue. Tide head has a 2017 pumper but a 27-year-old (1997) backup pumper and an almost 25-year-old rescue truck. Considering Atholville's average call volume of three incidents per month and a structure fire every two months over the six-year study period, the fire station is over resourced. We recognize the practical difficulty of trying to reduce and redistribute assets in Atholville but it is now part of a larger fire department with readily available backup resources rather than a stand-alone fire service.

[19] When the municipalities, which are now part of the new municipality, were separate, each was responsible for its own fire protection and they chose to establish individual fire services. When assistance was needed, the next closest fire service was called; for example Atholville may have called Tide Head or Campbellton for additional firefighters or vehicles. This is mutual aid or automatic aid depending on how the agreement is set up. Mutual aid and automatic aid agreements are no longer required in the new municipality because the stations are part of one fire service and the stations would be dispatched, as needed, within the municipality. Mutual aid and automatic aid agreements would still be required with fire services outside the new municipality.

Our recommendation, already stated, is to decommission the Atholville and Tide Head fire stations and redistribute the assets. An option is to decommission the Atholville station because of its proximity to the Campbellton area station, and house only one pumper at Tide Head with backup from Campbellton. Tide Head has responded to approximately 11 incidents a year over the study period and structure fires have averaged approximately one every five or six months.

If council determines it is best for both stations to remain open, we recommend

- housing only one pumper at each station; backup for the few structure fires would be from Tide Head and Campbellton station for Atholville, and from Atholville and Campbellton for Tide Head,
- using one of the pumper vehicles to replace the 2006 International pumper in Val D'Amour (the 2006 pumper can be reserved as a backup for maintenance and repair purposes),
- relocating the 2018 Atholville rescue to the Campbellton area station to replace the 1999 rescue (even though it has low mileage).

Another consideration would be to decommission the 1989 Rescue truck in St. Arthur, and Val D'Amour or another station, depending on Council's station decisions, could server as the rescue resource for St. Arthur.

Appendix B, Anticipated Vehicle Replacement Timeline, indicates the approximate time frame for replacing fire vehicles in the new municipality based on modified National Fire Protection Association recommendations. For example, NFPA recommends a 15 to 20-year replacement cycle for pumpers whereas Appendix B might use 20 to 25 years to recognize the low use of some vehicles.

There are other opportunities to rationalize the current fleet such as selling one or two of the pumpers discussed above and updating one or more of the tankers (a 1992, a 1995, and a 1996). The options will be influenced by the range of decisions available to Council, but there are opportunities to rationalize the number of resources within the new fire service.

7.3.2 Another Approach to Fire Suppression

While we recognize that out-of-the-box thinking regarding fire suppression and resource allocation is rarely considered, mainly because of potentially untraditional approaches, it's important to raise some possibilities so that councils can, at least, consider that fire suppression doesn't exclusively mean firefighters and fire trucks.

We estimated earlier that apparatus replacement is around $300,000 to $750,000 for used pumper units, and $175,000 to $500,000 for used rescue vehicles (new pumper vehicles could be up to a million dollars). The eventual cost of replacing two units in Val D'Amour could be between $600,000 and $1.5 million plus continued repair and maintenance, and repair and maintenance of the fire station.

Alternatively, there are approximately 480 private dwellings in Val D'Amour, according to Statistics Canada, and likely other commercial establishments. Data from Canada and other jurisdictions show that more than 90% of fires occur in single or semi-detached residences or row houses such as condominiums. Retrofitting residences in Val D'Amour with fire sprinklers would cost an average of $3,000 to $3,500 or a total of about $1.5 to $1.7 million for the community. That figure is comparable to replacing fire trucks plus station maintenance, and sprinkler systems last much longer than fire trucks although the heads may have to be replaced in about 15 years.

We recognize that an initiative like this would have to take place over several years, but it eliminates the need for the ongoing replacement and maintenance of fire trucks, buildings, and equipment in the community. Although a fire in a building with sprinklers still requires fire department response, that response for Val D'Amour, and possibly Atholville, can come from Campbellton area station, and the fire may be out before arrival.

We have been made aware that buildings in the area are self-serviced (on wells) and water availability is a problem in summer. Retrofit of sprinkler systems includes a 600 – 800 litre water reserve tank which would be the first source of sprinklered water in a fire situation.

We also understand there are challenges when alternatives that are not time-honoured and traditional are suggested but the greater challenge may be the continued cost of a fire station when options are available for consideration.

Ideally, the frequency of fires and other emergencies will decline with enthusiastic prevention and public education efforts from the fire department. But there are forms of fire suppression, apart from traditional methods, that should be considered.

7.3.3 Insurance Impact

An important question that arises whenever recommendations about changes in fire service levels are posed is how changes will impact insurance. The answer is: we don't know. The only ones who do know are insurance companies and they are reluctant to offer specifics since every building is unique, including the occupants.

Pomax has been trying to find applicable guidelines to apply to insurance impact since 2011. The result is that we have a few examples but nothing of a nature that we, or anyone else, could point to even as a rule of thumb. Our inquiries have included interviewing the Fire Underwriters Survey company, major insurance businesses, brokers, and individuals who have actually experienced insurance rate adjustments concurrent with changes to fire service coverage. During those interviews over the past 13 years we have learned

- Fire insurance represents only a portion of a premium. Other insurance cost considerations include local and individual history of claims, crime, flood, and artwork or jewelry riders etc. So, changes in fire response coverage affect only a portion of individual premiums.

- Fire Underwriters Survey assessments, which are then provided to insurance carriers, take into account public education and prevention efforts. Insurance rates may be positively affected by robust prevention and public education programs.
- Social aspects are included in individual insurance rates. For example, are residents smokers? Is wood used for heating or is a wood fireplace or stove part of the insured area?

There are many individual factors that affect the fire portion of insurances but here is some anecdotal information we have gathered from interviews and experience:

- A municipal councilor (another province, rural municipality) informed us that her insurance rate increased by fifteen dollars annually after a fire station, approximately five kilometers from her residence, closed.
- A resident indicated to a fire chief (Pomax client) that he realized a reduction of $100 annually (about 5%) after the local fire service achieved fire shuttle accreditation, which is considered somewhat equivalent to having hydrants available. Shuttle accreditation, if achieved, is applicable only to buildings within 8 kilometres of a fire station.
- Chubb Security told us that closing a fire station, resulting in the next closest fire station being more than 8 kilometres, would increase insurance up to $5,000 a year – approximately 10% - on a $25,000,000 summer home.
- Personal experience shows that installing a residential sprinkler system in a home with no smokers, wood stoves, or fireplaces achieves about a 5% savings, or $100.00, annually.

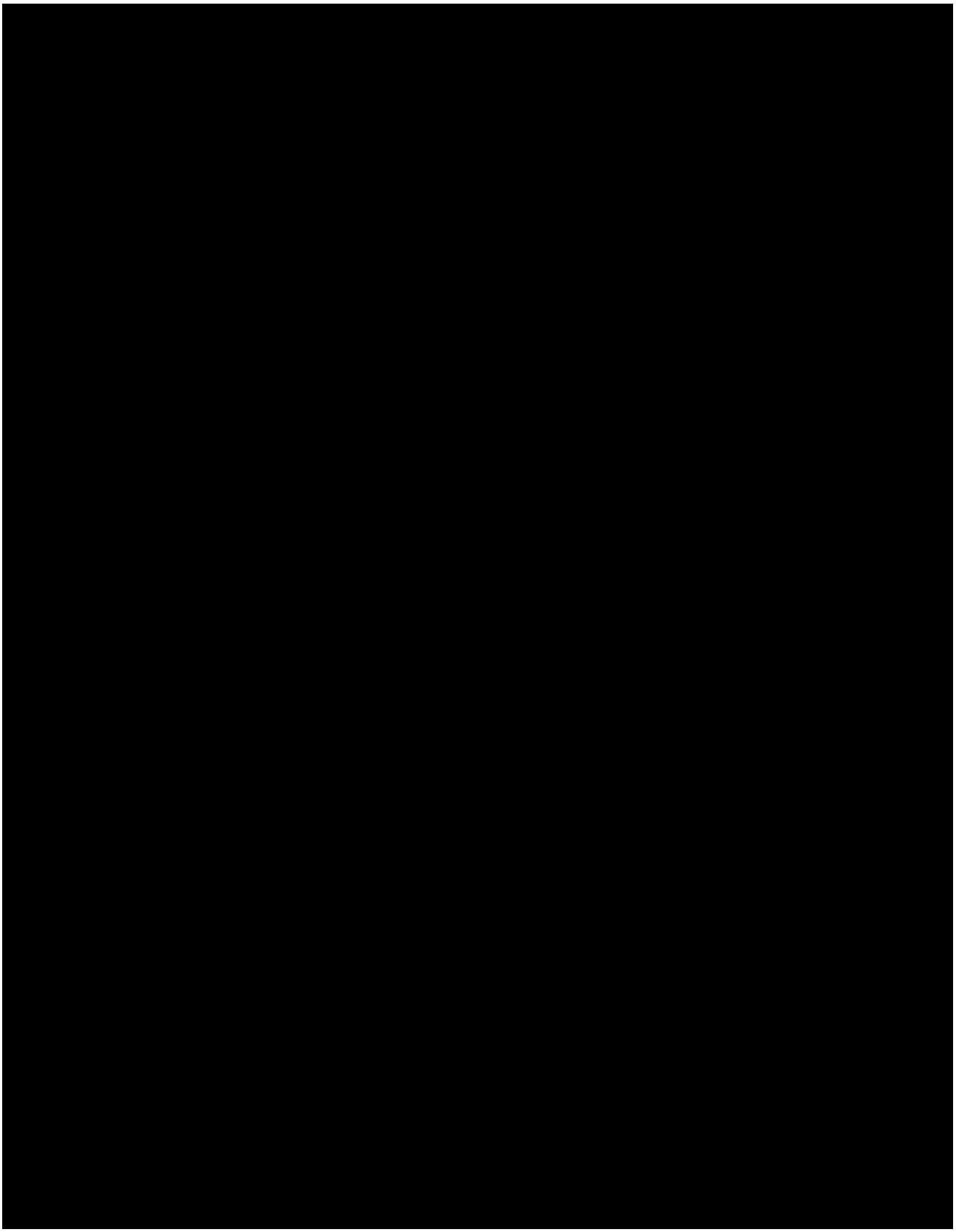
While it's very difficult to determine the impact closing fire stations may have on insurance, we could use 5% to 10% as a guideline, although that could be mitigated by improved prevention and education initiatives which we address in Section 7.5.

7.4 Fire Chiefs

[redacted]

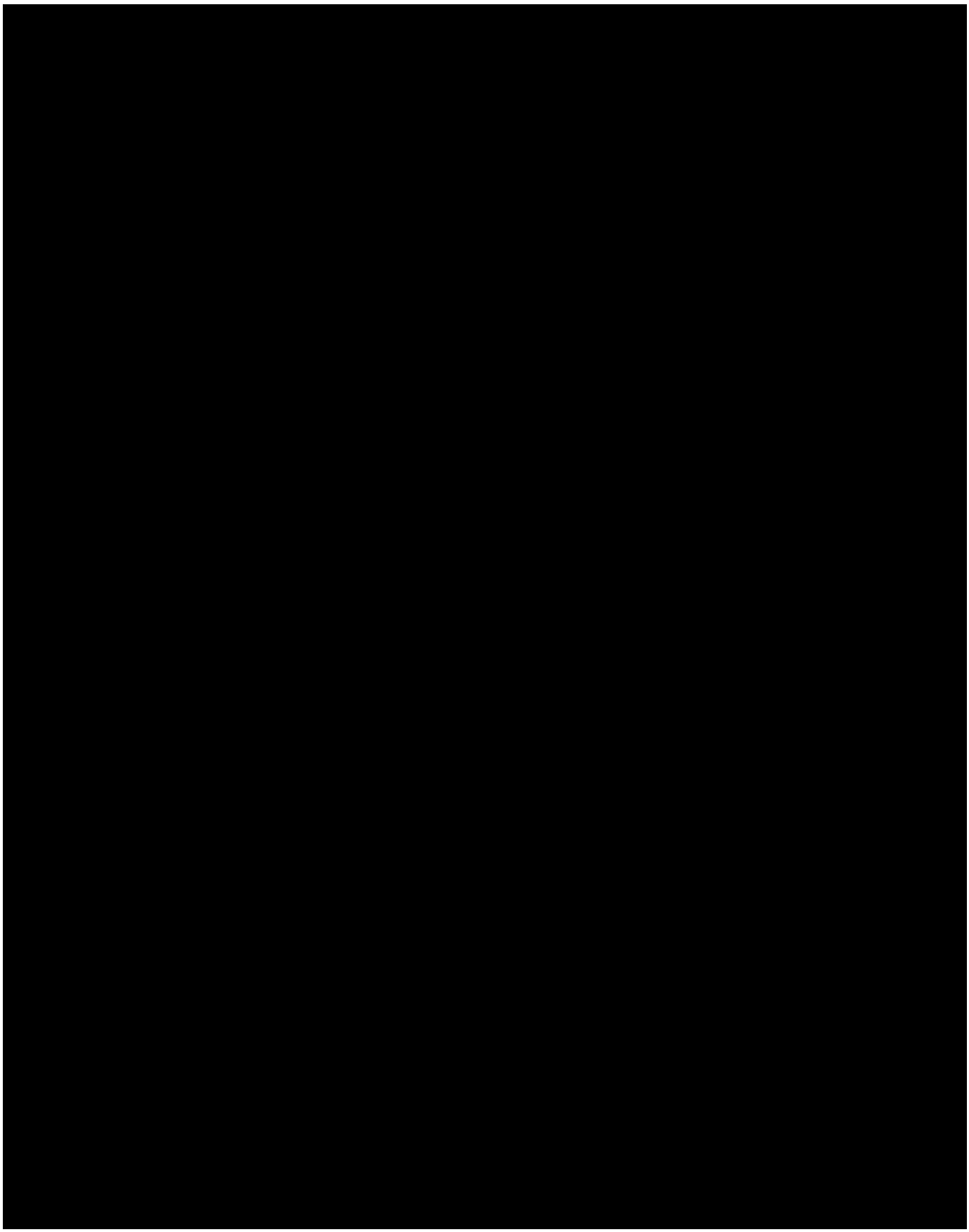
7.5 Full Time Staff

[redacted]



[20] We have shown that there have been a high number of fires in some areas, considering the low population levels, particularly Val D' Amour (if the data is correct).

7.5.1 The Practice of Volunteers Sleeping at Stations



7.6 What Attracts Volunteers?

Based on our interviews with volunteers in many municipalities, people are attracted to fire departments for two primary reasons: 1) service to neighbours and the community; 2) a means of gaining experience to become a full-time firefighter.

There are subtleties within these reasons; for example, some enjoy the emergency aspect of fire services while others who may have retired from full time firefighting like the camaraderie of being an emergency responder but don't want the constraints associated with a full-time career.

More important is the quandary of how to attract and retain volunteers. Just like in non-emergency organizations, volunteers have to perceive that a benefit results from what they do, either for an organization or community, or for themselves. Looking at the history of fire department volunteerism, the literature describes small communities that sometimes suffered a major fire, possibly with loss of life, wherein residents came together to help each other in similar circumstances, and volunteering offered some personal as well as community protection. Our experience is that smaller, rural environments that are not within convenient commuting distance of large centres have less trouble finding volunteers than moderate size locations.

The new municipality should reference an informative publication titled Volunteer Fire Service Culture: Essential Strategies for Success[22] by The National Volunteer Fire Council. This textbook

[21] Structure fires are the benchmark for rapid response. Other incidents, such as cardiac arrest also are time sensitive.

[22] Search: Volunteer Fire Service Culture: Essential Strategies for Success which is available for download.

puts forward the reasoning that people are willing to volunteer with emergency organizations providing

- the experience is rewarding and worth their time;
- the training requirements are not excessive;
- the time demands are adaptable and manageable;
- they are rewarded with a personal sense of value;
- there is good leadership minimizing conflict;
- there is ample support for the organization from the community.

The document, which was reviewed by the American Psychological Association, also addresses workplace organizational and culture models which can have a significant impact on attracting and retaining volunteers.

Although, within this document, we can touch the edges of a challenging, complex problem we suggest downloading and referencing the National Volunteer Fire Council publication which may be a greater benefit to the municipality.

As a final comment about volunteers, a few weeks before writing this report Pomax discussed the issue of attracting volunteers with another client, which is similar in population and area to the new municipality. An added challenge for this client is that the township is located close to a major metropolitan area and many volunteers commute for work, particularly weekdays. The Chief said, however, that the fire department has little trouble attracting volunteers and achieving turnout levels, although weekday business hours have a slightly lower incident response. [redacted]

8 Other Important Considerations

This section addresses topics or questions that were asked during this project. They are included here if the items did not clearly fit into previous sections of this report or require additional comment.

8.1 Services That Should be Provided by the Fire Department

Services that should be provided by the fire department are those where there is scientific or empirical evidence of benefit to public safety. These include prevention, public education, fire suppression, response to drowning, occasional medical calls (cardiac arrest, anaphylaxis compromising respiration, respiratory arrest), entrapment rescue (motor vehicle, machinery, environmental, trench, high angle), and hazardous materials.

Prior the mid-1990s fire departments responded to few medical or traffic incidents but over the past 30 years the practice of generally calling out fire departments to a wide range of incident types, which include traffic control and minor medical or traffic incidents, has become widespread. In some cases, fire departments can be of great benefit at the more serious events at these types, but most events aren't serious. One example of these call outs for 'better safe than sorry' purposes was presented earlier; that of fire departments being dispatched when airbags are deployed.

An examination of the efficacy of fire department response to medical and traffic incidents, which, combined with automatic alarms, make up 80% or more of all events, would take another one of those 30 page papers previously mentioned. However, for an accurate history of how fire departments became, what is often referred to as, 'an all-hazards emergency service' can be found in a paper by Dr. Susan Braedley, an assistant professor at the School of Social Services, Carleton University, Ottawa, called Pulling Men into the Care Economy: The Case of Canadian Firefighters (Vol. 19(3) pages 264-278) which was published in Competition and Change[23] journal (pages 267-273 carry the main information).

It is easier to dispatch the fire service to almost every call type, which has become the industry practice over the past 30 years, than to use data, work with the dispatch centres to refine call taking procedures, and question the value of activity, which is what we have suggested throughout this document.

The data and literature do not support the 'just in case' or 'better safe than sorry model' of fire service deployment. In addition to the list of incident types noted in the first paragraph of this section, we recommend that the municipality should employ a strategy of using outcome data to determine the need for response and then ensure the types of incidents to which the fire

[23] Competition & Change is a peer-reviewed academic journal that covers the fields of political economy, globalization, financialization, global value chains, and Critical Management Studies.

department responds, and the level of service offered are captured in a fire department establishing and regulating bylaw.

8.1.1 Level of Service

The municipality should also decide the level of service to be provided for those incidents to which it responds. The National Fire Protection Association defines three levels of service which require levels of training commensurate with the service provision. Requirements for, and guidelines applicable to these levels can be found in NFPA Standards 472, 1006, 1670 and others.

The service levels, as described in NFPA are predicated on an organization's abilities, training levels, and availability of internal and external resources. As an example, trench rescues are rare, so many fire departments train to an awareness level and contract with a local private company (if available), or another fire department to provide trench rescue at a higher skill level. Conversely, if incidents such as ice or water rescue, or transportation from a snow trail occur two or three times a year the municipality should consider having a team trained at the operations or technician levels, plus equipment, and ongoing training to provide the required services.

NFPA service levels are

- **Awareness.** This level represents the minimum capability of a responder who, in the course of his or her regular job duties, could be called upon to respond to, or could be the first on the scene of an incident. In a structural fire incident this may mean that a firefighter may be trained only to the level of applying an agent (water or foam) from outside the building
- **Operations.** This level represents the capability of hazard recognition, equipment use, and techniques necessary to safely and effectively support and participate in an incident response or technical rescue incident under the supervision of technician-level personnel.
- **Technician.** This level represents the capability of hazard recognition, equipment use, and techniques necessary to safely and effectively coordinate, perform, and supervise an incident response or technical rescue incident.

Fire department leaders are intimately familiar with these capability levels and, preferably based on good data, will advise the municipality of the service levels that should be provided and the associated training, equipment, and other asset requirements.

8.2 Asset Allocation and Vehicles

Asset allocation and vehicles was dealt with in Section 7.3.1, Station and Apparatus Resources, and Appendix B, Anticipated Vehicle Replacement Timeline. Other comments are

- Fire department assets should be recorded as part of the corporate asset program. Caution should be exercised so that references to vehicles or equipment are consistent between corporate records and fire department records.

- Equipment and disposable inventories should be maintained up to date at a central location. While station chiefs or staff might contribute to inventory maintenance, central monitoring should be accomplished through oversight of the Chief.

8.3 Budget Information

- Prior years' budget information wasn't as available or useful as we had hoped. We expect that ongoing organization within the Regional Community will mean that future fire department budgets and expenditure records will be more sufficient under control of the Chief and corporation.

8.4 Vehicle Maintenance and Repair Records

- Neither detailed nor summary records for vehicle repair, maintenance, and fuel costs were available to the extent that would allow Pomax to calculate the cost of operation by vehicle.
- Maintenance and repair records should include separate invoices or repair records for each vehicle plus maintenance or repair activity, mileage, operating hours, date of work, and detailed parts and labour cost. Ideally, fire apparatus records would be part of a corporate fleet repair and maintenance software program.

8.5 Attending Traffic Incidents

The background to this issue was partially addressed in Section 8.1.1, Level of Service. Also please see Footnote 15 on page 38. Our recommendation is that the Regional Community should withdraw from the NB 911 Motor Vehicle Collision Operating Directives agreement (Appendix A) but the Regional Community should advise the 911 Centre, in writing, that the fire department will respond to traffic incidents where bystanders or witnesses report entrapment, fire, or other reasons for fire to attend, but not because of keywords as included in the NB 911 Motor Vehicle Collision Operating Directives.

Other questions that arise when the practice of fire attending traffic incidents is discussed – even if there are no victims to extricate or attend – include, what about the fire department function of blocking traffic or cleaning up spilled fluids or debris, and who is going to pay for duties that have become part of the range of fire department procedures. Answering these questions requires addressing the background of how these duties came to be part of fire department undertakings (please also see Section 8.1, Dr. Susan Braedley).

In many situations when fire is dispatched to a vehicle incident two fire trucks are sent. In some cases two trucks are deployed because the situation appears serious enough to warrant more than one truck, sometimes two trucks are sent because more than one truck is needed to convey firefighters. But, most often, one truck is sent to work at the incident while the second one is used as a blocker to protect the accident scene. This is more prevalent in multi-lane and highway situations. The idea behind this deployment model is that if a member of the public

doesn't become aware of the accident scene and drives into it, rather than around, it is better to strike a 20+ tonne fire truck than a police vehicle or ambulance, or emergency workers. There are some occasions where fire isn't required on scene for emergency work, but a truck is called for blocking duties to protect the fire department's emergency co-workers or fluid and debris cleanup. The fire department may participate in assisting paramedics if there are injuries.

The deployment of fire to traffic incidents has become prevalent in the last 20 years, in part because of the US influence of fire – paramedic services, social, and other media which leads the public and fire department to accept this unvalidated practice, and because it is 'response' and response is considered to be a useful activity.

Studies about secondary accidents question whether the prevalence of emergency vehicles at a traffic incident increases, rather than decreases, the risk of secondary accidents[24].

The Regional Community should consider the following questions when contemplating the efficacy of dispatching fire to traffic incidents:

- What is the cost and effectiveness of resource use by sending two fire trucks with lights and sirens to traffic incidents where their role is usually first aid (which is not time sensitive), cleaning up fluids which could be done by a tow truck driver, or road blocking?
- Almost everything to which fire responds results in the use emergency lights and sirens which increases public risk. Is this a practice that should continue? There are few true emergencies.

8.5.1 Should Fire trucks be used as Blockers?

There are several studies about collision scene security. The safest practice seems to be to place large cones starting at least 100 metres – some studies suggest a kilometre – before the incident scene to move traffic into an alternate lane or onto the shoulder. Then, if a driver doesn't recognize the emergency, they can be alerted by the noise of running over several large cones. That's usually impractical, though, unless the Department of Transportation and Infrastructure or local public works is immediately available to respond and assist with the setup. Police are responsible for traffic control which means that police may have to ensure resource availability for this purpose.

[24] a) Preventing Emergency Vehicle Crashes: Status and Challenges of Human Factors Issues; Hongwei Hsiao, National Institute for Occupational Safety and Health, Morgantown, West Virginia, Joonho Chang, Dongguk University, Seoul, South Korea, and Peter Simeonov, National Institute for Occupational Safety and Health, Morgantown, West Virginia; HUMAN FACTORS Vol. 60, No. 7, November 2018, pp. 1048–1072
b) U.S. Fire Administration Emergency Vehicle Safety Initiative; Interagency Agreement No. 2009-DE-R-103 and awarded by the National Institute of Justice (NIJ), Office of Justice Programs (OJP), U.S. Department of Justice (DOJ) to the U.S. Fire Administration (USFA).
c) Causes and Prevention Measures of Secondary Rear-end Accidents in the Rescue of Highway Traffic Accidents; YU Qing-yuan; Kunming Fire Service Training School, Kunming 650208, China; Procedia Engineering.

8.5.1.1 What happens when fire truck blockers are hit?

Some firefighters state "Think of what could have happened if we weren't there".

- In response to this question we say: We don't know what would have happened.
  - Would a police vehicle have been hit?
  - Would someone have been injured or killed who would not otherwise have been injured or killed?
  - Would the incident not have happened because the police vehicle is smaller, and the inattentive driver would have missed it?
  - Is it the role of the fire service to act as traffic control? Would it be better to place one or two unoccupied police vehicles approximately 100 metres ahead of the traffic incident and, if those were struck, would the loss be a $60,000 to $80,000 police vehicle rather than a $750,000 fire truck?

We can't answer the question, and don't know what would have happened if the fire truck wasn't there. Studies of the subject have not been able to arrive at a conclusive answer as to whether the presence of a fire truck, as a blocker, improves safety or increases risk. Studies have demonstrated that fewer emergency vehicles and flashing lights at an incident reduces the risk of all types of secondary incidents[25].

One study shows that the vehicle causing a secondary incident is usually a large truck (80%)[26]. The result of a fire truck being struck ranges from possibly several hundred thousands of dollars damage and months of out of service time, to replacement of the truck and two or more years of lead time to order. At worst, as shown in the last of the images below (left side), one firefighter deceased, and a police officer injured. The bottom right incident resulted in the driver of the car being pronounced dead on scene, and one passenger and four firefighters injured. Using fire trucks as blockers didn't avoid death and injury.

[25] Preventing Emergency Vehicle Crashes: Status and Challenges of Human Factors Issues; Hongwei Hsiao, National Institute for Occupational Safety and Health, Morgantown, West Virginia, Joonho Chang, Dongguk University, Seoul, South Korea, and Peter Simeonov, National Institute for Occupational Safety and Health, Morgantown, West Virginia; HUMAN FACTORS Vol. 60, No. 7, November 2018, pp. 1048–1072

[26] Causes and Prevention Measures of Secondary Rear-end Accidents in the Rescue of Highway Traffic Accidents; YU Qing-yuan; Kunming Fire Service Training School, Kunming 650208, China; Procedia Engineering.

These are all risks that need to be considered when deciding to use fire trucks as blocking vehicles.

At 3:14 p.m., troopers were sent to the southbound lanes of I-71 for a report of a minor injury crash involving one vehicle. Troopers began to investigate the crash when units with the Town & Country Fire District arrived to assist, the news release states.

We recommend that before determining if the practice of fire response to traffic collisions should continue some questions should be considered:

- If the fire department is going to provide first aid at a traffic incident, when does the paramedic service arrive in relation to the time of arrival of fire? Are the arrival times of fire and paramedics proximal to the extent that the fire department doesn't need to offer substantial aid?
- Does having many emergency vehicles on site make the situation safer or higher risk (secondary accidents)?
- Is there validity in using a fire truck ($750,000 to $1,000,000 replacement) as a blocker or should it be a department of highways, public works, or a purpose-built truck? Some fire services in the US are using second line vehicles as blockers or purchasing purpose-built trucks.
- Is traffic control the responsibility of fire departments?
- Does the Regional Community want the fire department to take on the traffic control role and under what circumstances (people trapped, request of Ambulance New Brunswick)?

There is also the consideration of who or what service will act as traffic blockers or take care of roadway cleanup if fire doesn't attend, and who will bear the cost? Police are responsible for traffic control so we suggest that is where that responsibility lies. Roadway cleanup and minor coolant or other spills can be taken care of by tow truck drivers, who carry the same fluid absorbent as the fire department, and who will invoice vehicle owners or their insurance companies.

As with everything else, nuance informs decisions. Whether the municipality decides to continue responding to traffic collisions, the purpose of our discussion is to be convincing that operational and administrative decisions should be made on complete data, which is not yet available to the community but should be developed. This recommended approach does not preclude those situations where information from the scene clearly indicates the need for the fire service, but we recommend against deployment based on key word usage that has not been validated.

8.6 Reducing Automatic Alarms

Automatic alarms responses are addressed in Section 4. In an effort to reduce automatic alarms and the resulting false fire calls, some jurisdictions have resorted to fining owners of premises after the second or third false alarm incident. There has been concern expressed that such fines are not legal in New Brunswick. But an example of a municipality that does apply fines for false alarms can be found in By-law 3-20, Municipality of Rothesay, Schedule A.

Alternatively, a practice in the United Kingdom is to require owners of buildings that experience frequent false alarms to install detection systems that monitor smoke, heat, and carbon monoxide levels and connected to a 24-hour monitoring station.

8.7 Should Volunteers Respond to the Station or to Incidents

The question of whether volunteers should respond to the fire station when called in, or directly to an incident, is discussed across Canada. Most fire departments agree that, ideally, volunteers should respond to the fire station, which is where turnout gear should be located, don the turnout gear, and respond together in a fire truck. The difficulty with this deployment model is if a volunteer has to drive past an incident to reach the fire station or if a volunteer is responding from a location between a fire station and the incident. In such a case, the volunteer would travel away from the incident to the station and then double back to the incident.

Volunteer firefighters sometimes carry turnout gear in their vehicles, preferably in a protective bag. The bag should not only protect the gear from abrasion or other damage, but protect the firefighter and family from carcinogens that are known to exist in the gear and from attending fires. That is why it is preferable to keep gear clean and in the fire station. A policy to respond to a fire station may mitigate exposure to carcinogens.

If a firefighter or firefighters arrive at an incident, particularly a structure fire, before the first fire truck, what can they do? In almost all circumstances all that can be done is to evaluate the fire situation (called size up) and await the arrival of a fire truck. If two or more firefighters arrived before a fire truck, a rescue could be performed although that is highly dangerous.

From a health and safety perspective we would recommend that volunteers respond to the fire station, which is where gear should be kept, and respond to an incident as a team. The practicality of that may be different.

Again, to answer this question we would turn to statistics. Even though the fire stations don't have the statistics we are going to suggest, the data should be developed prospectively. Volunteers should record and report, for incidents that occur in the next six months, whether they respond directly to an incident or to a fire station, when the fire truck arrives, and whether the volunteer was closer to the incident or fire station. The results of this survey may provide sufficient information to enable the municipality to make a decision about volunteer deployment.

Our conclusion is that responding as a team from a fire station is the better model considering that there is little that firefighters can do at a structure fire without a truck and equipment; there is danger – and probably municipal liability – if a rescue attempt is made without backup or a truck on scene; and, other than structure fires and a few other types that have been discussed in this report, a few extra minutes to travel to a fire station is unlikely to be life threatening. But there are exceptions. For example, responding to the scene of a cardiac arrest, if that is faster than first going to a fire station, may make a difference. That is one of those events where minutes and seconds count.

We recommend a policy that volunteers respond to the fire station but with exceptions such as cardiac arrest. There are likely other exceptions so any policy will require monitoring, information gathering, and adjustment.

8.8 Volunteer Compensation

8.9 Future Strategy

Fire master plans are expected to suggest timelines for change over a 10-year period which often manifests in the form of new fire stations, trucks and equipment, and additional staff. That was a traditional approach that included a combination of crystal ball gazing and forecasting based on low, medium, and high growth possibilities. Interestingly, there is no evidence that municipal growth results in an increase in fires, at least for 10 to 20 years, although it may result in additional call volume due to attendance at medical calls and traffic incidents if a municipality determines it wants its fire department to attend such events.

Pomax's approach to master plans is to identify expected change if there is evidence to support such a conclusion. Otherwise, we recommend the adoption of a strategy of containing costs while improving public protection, and judicious asset reconciliation which includes not only decommissioning assets but also acquisition based on robust data.

This report aims to assist the Campbellton Regional Community and its fire department to become self-sufficient through good data gathering techniques and accurate analytics, including courses and other education in support of data. In that way, the Regional Community will be able to monitor trends and outcomes on a regular basis and report to the Chief Administrative Officer and Council the effectiveness of efforts such as prevention, public education, and response. Pomax is willing to remain available to assist as part of the current assignment.

Appendix A NB 911 Motor Vehicle Collision Operating Directives

Subject: Motor Vehicle Collision (MVC)

Policy: The PSAP is responsible to notify all required ESPs.

Authority: *Emergency 911 Act*

Procedure: *The PSAP Operator will:*

Transfer to primary ESP

- Transfer the call to the ESP dispatcher of primary importance.

Contact Ambulance

- Contact the ambulance ESP if the caller identifies keywords such as: ambulance, bleeding, hurt, injury, flipped or rolled over, trapped, vehicle in water, airbags deployed.

Contact Fire

- Contact the fire ESP if the caller identifies keywords such as: smoke, fire, flipped or rolled over, trapped, vehicle in water, airbags deployed, spill, chemicals, dangerous goods.

X_ Identifier

- The fire departments that opt to carry the Flag Identifier, X_ as it appears in the Cross Reference Table, will receive all calls to motor vehicle collisions when the caller reports injuries, whether other fire related keywords are mentioned or not.

Contact Police

- Contact police for all motor vehicle collisions.

Related Policy:

OPD C-1 9-1-1 Caller to Public Safety Answering Point (PSAP)
OPD C-2 PSAP Operator to Emergency Service Provider (ESP) Dispatcher
OPD C-3 PSAP Unable to Contact Primary ESP
OPD C-4 Multiple ESP Response
OPD E-3 ESP to PSAP Communication
OPD E-4 ESP Response Area

APPENDIX E

FIRE SERVICE ENHANCED CHANGE REQUEST FORM

DO NOT PROCEED WITH CHANGE WITHOUT PRIOR AUTHORIZATION FROM THE APPROPRIATE APPROVAL AUTHORITY
(* Minimum of 45 days advance notice for any change)

Date : _____ Date requested for change: _____

Requestor's name : _____ Approval authority: _____

Contact name: _____ Contact phone: _____

Request **to be notified** for all Motor Vehicle Collisions with Injuries ☐

Request **not to be notified** for all Motor Vehicle Collisions with Injuries ☐

By requesting to be notified for all Motor Vehicle Collisions in the area covered by the _____ Fire Department, the Fire Chief and the Municipal Services Representative / Town or Village Administrator understand that:

1. Fire departments providing this enhanced emergency service are mandated to respond once notified. The ability to respond with qualified personnel is imperative.
2. The following have been considered: enhancing and maintaining the current level of training, availability of personnel 24 hours, seven days a week, liability and compensation benefits.
3. The fire service response, in the case of a local service district fire department, will be responsible to render first aid assistance as recognized by the Level 1 – NFPA 1001 Standard for Firefighters Professional Qualifications.

Fire Chief	Municipal Services Representative Town/Village Administrator
Date	Date

Please forward the completed form to the NB 9-1-1 Bureau at least 45 days in advance.

Appendix B Anticipated Vehicle Replacement Timeline

Station & Call Sign	Location	Year	Make	Mileage	Anticipated Replacement Year																											
					2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Campbellton																																
ACA4	Admin.	2016	F-150	78,562																												
LCA3	Ladder	2008	International	15,651																												
PCA2	Pump	2018	MaxiSaber	19,959																												
PCA1	Pump	2014	Saber	23,063																												
RCA5	Rescue	1999	F-450	16,308																												
TCA7	Tanker	1996		53,322																												
Atholville FD																																
PAT5	Pump	2018	Freightliner																													
PAT4	Pump	2014	International																													
RAT3	Rescue	2018	International																													
Tide Head FD																																
PTH4	Pump	2017	International																													
PTH1	Pump	1997	Ford F-Series																													
RTH3	Rescue	2000	Ford E-450																													
St. Arthur FD																																
PSTAR1	Pump	2020	International																													
RSTAR3	Rescue	1989	GMC																													
TSTAR2	Tanker	1995	Ford																													
Val D'Amour FD																																
PVA1	Pump	2006	International																													
RVA2	Rescue	2018	International																													
TVA3	Tanker	1992	GMC																													

Appendix C Brigade Compensation Scales

Campbellton Area

Levels	**Hourly Rates**
A new recruit I	12.75
Level 1Certified and ICS100 I	15.30
Level 2 Certified I	17.85
Level 2 plus Driver and Pump Operator	19.00
Level 2 plus 1Specialty	19.00
Level 2 plus 1 Specialty plus Driver and Pump	20.40
Level 2 plus 2 Specialties	20.40
Level 2 plus 2 Specialties plus Driver and Pump Operator	23.25
Level 2 plus 2 Specialties plus Driver and Pump	23.80
Level 2 plus 2 Specialties plus Driver and Pump Operator plus Officer II plus Basic Fireground Command	25.32
(1) Rates are all inclusive (4% vacation, etc.).	
(2) Yearly union increase(s) apply- starting in 2021.	
(3) Training has to be approved by the fire chief prior to taking place.	
(4) Proof of certification and Fire Chiefs and CAO's approvals are required for any brigade member to be moved up the scale.	
BI-ANNUAL RETAINER RATES	
Position	**BI-ANNUAL RETAINER RATES**
Deputy Fire Chief	150.00
Chaplain	100.00
Public Information Officer	100.00
Captain	100.00
Lieutenant	75.00
Chairman	75.00
Firefighter	50.00
(1) Retainers are paid bi-annually.	
(2) Individuals are only eligible for one retainer should they hold more than one position.	
(3) calculations are as per Fire Department Retainer Policy and Procedure.	
(4) Payment of retainers requires the approval of the Fire Chief and the CAO.	

Atholville

Chief	$ 375 / Monthly = $ 4,500 / Year
Brigade Call Ins (Paid Monthly)	$ 15 for Call In (even if under an hour), then $ 15 per hour after
Training / Practice (Paid Monthly)	$ 20 for whole practice
Brigade Retainer (Paid Annually)	$ 500.00 per course, payment is spread over 5 years
Meals	$10.00; $20.00; $30.00

Val D'Amours

Chief	$ 300 / Monthly = $ 3,600 / Year
Brigade Call Ins	Not Paid
Training / Practice	Not Paid
Brigade Retainer	Not Paid - Lobster supper once a year

Saint Arthur

Chief	$ 650 / Year ($ 600 net)
Brigade Call Ins	Not Paid
Training / Practice	Not Paid
Brigade Retainer	Not Paid

Tide Head

Chief	$ 500 / Year
Brigade Call Ins (Paid in June & Dec)	$ 14.75 / hour
Training / Practice (Paid in June & Dec)	$ 15.00 for whole practice
Brigade Retainer	None