



United Counties of Leeds and Grenville: Regional Fire Services Review



March 4, 2021

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1. Report Summary

We open this report with the following excerpt from *INCIDENCE, CIRCUMSTANCES AND RISK FACTORS OF RESIDENTIAL CARELESS COOKING FIRES IN THE CITY OF REGINA*; **ROZZET JURDI-HAGE, CANDACE GIBLETT, AND ANGELA PRAWZICK**; UNIVERSITY OF SASKATCHEWAN, REGINA FIRE AND PROTECTIVE SERVICES because it wholly captures the findings within, and theme, of this report: Change can happen.

Traditionally, fire services focused their attention on the suppression component of fire control (for a recent example, see Levin 2013), allocating fewer resources to fire prevention, and focusing on technological and engineering solutions to fire (for a review on the need for a more ‘holistic’ approach, see Rhodes and Reinholdt 1998). Two related trends contributed to this: i) Protecting hosts from fire-related liability or the “victim-blaming assertion” (Gielen and Sleet 2003), which in turn resulted in dejection of individuals’ accountability for fires; and ii) the incorrect assumption that “it is [fire services’] responsibility to deal with fire, usually ... through the application of technological approaches to improving suppression capability” (Rhodes and Reinholdt 1998:43), because people are thought of as “passive victims”, who need help from fire services or engineering solutions to prevent and suppress fires. That is, human behaviour is modelled as “purely reactive”. Combined, these assumptions led to the notion that preventing the fire to begin with is not possible – certainly not possible by changing human behaviour. Fire can be controlled or mitigated only once it is started. This notion is in line with what Brennan and Thomas (2001) characterize as a “reactive” model, grounded on the underlying assumptions that fire is an “externally imposed event”, “independent of occupants”, who are, in turn, “subjected to fire”. That is, it discourages people from taking an “active role” in protecting themselves (Gielen and Sleet 2003).

Even common words used by the fire service underline these erroneous assumptions, which in turn inform the fire service on how to deal with fires, i.e., suppression instead of fire prevention. For example, noting that ‘cooking equipment’ caused fires is misleading. While the cooking equipment provided the heat source, it is rarely the cooking equipment that is not working properly. It is the person using the cooking equipment who uses it carelessly or continues using it despite its showing previous signs of malfunction. Using terminology in this way forms a commonly accepted mindset that it is the equipment that causes fires, not humans. Therefore, the logical conclusion is that there is no point in developing programming to change human behaviour, which undermines human-based public safety initiatives. This practice is manifested through the usage of terms like “accidental”, taken from investigation terminology applied to public information, supporting the mindset that if the incident was “accidental”, then the individual could not have done anything differently to avoid its imminent occurrence.

We join scholars like Brennan and Thomas (2001) and Rhodes and Reinholdt (1998), among many others (e.g., Thompson and Wales 2015; Wales and Thompson 2013), regarding the need of a firefighting paradigm shift from a narrow “reactive” model for fire safety to an “interactive” model that acknowledges the important role of human involvement in fire causation, escalation and spread, and addresses the high vulnerability of particular groups to fire hazards.

Read the report:

<https://www.uregina.ca/arts/assets/docs/pdf/Cooking%20Fires%20Report%202017.pdf>

a) False Hopes, Reality, and Practical Solutions

We take the responsibility of protecting life seriously which is why we will tell you in this report that the current fire service structure in the United Counties of Leeds and Grenville needs to take on that same paradigm shift as expressed in the excerpt on the previous page. Expecting rapid response and fire suppression efforts to save lives and property is, for the most part, false hope.

Why do we say, "Expecting rapid response to save lives and property is mostly false hope"? It is really a simple fact of the geography of the area. The abundance of lakes, rivers and large tracts of forest and fields that provides a lifestyle attractive to many, also dramatically impacts the movement of volunteer firefighters and responding apparatus. The data and analysis provided in our report testifies to the difficulties in providing timely and effective emergency response across much of the area.

Almost eighty percent of the population of the United Counties of Leeds and Grenville is served by dedicated volunteer firefighters who respond across a broad land mass of predominately rural and wildland geography utilizing multi-lane, two lane, and rural roadways. Upon receiving an emergency call, volunteers must leave their current location and respond to the emergency scene or fire station and then on to the emergency location. All of this takes time. The addition and expense of more fire stations, equipment and firefighters would not reduce response times to emergencies to any significant degree, again, due to the geography of the area being served.

We are led to the conclusion that an increased emphasis on public education and fire prevention programs provides the most practical and realistic opportunity to enhance community fire protection in the United Counties of Leeds and Grenville. Seasonal or new permanent residents arriving from large urban centres bring expectations of emergency response previously experienced in larger communities. Larger communities employ full time firefighters where population density and efficient roadways allows for faster response times (but, in almost all cases, still [not sufficiently fast](#) for lifesaving rescue). 'Fast response' is not the case in much of Leeds and Grenville. Providing accurate and realistic information regarding the emergency response capabilities available to those choosing to live in rural communities, while emphasizing the need for personal responsibility for fire safety through public education, is critical to the creation of fire safe communities in the counties.

b) Change

Emergency services are tasked with the very important roles of protecting life and property, but they are still organizations and should be operated as efficiently, effectively, and safely as possible considering the expenditure of public money. During this study we were impressed with the concern, dedication, and ideas that we received from the fire chiefs. But they also told us that the resources available for the critical tasks of fire and [injury prevention and education are inadequate](#), and some stations struggle to attract a sufficient volunteer cadre, which means the fire services are not as effective as they could be.

As important as it is to respond to fires and rescues, prevention is more imperative because it is monetarily and socially better and less expensive to spend time preventing a fire than trying to put one out.

This report promotes changing the face of the fire service while acknowledging the historic, traditional methods of response. It is about turning towards prevention and public safety education as the primary directives of the fire services while ensuring adequate response capabilities when those prevention and public education methods are unsuccessful. It is about culture change, not only for the fire services, but also about convincing families, residents, businesses, and visitors that the responsibility of fire prevention and safety belongs to them, and not to expect – despite the best efforts of firefighters who will do all possible heroic things to save you and your property – that responders will arrive within minutes of a call for help to rescue victims, particularly in rural areas.

This report delivers an analysis of all current fire services and programs provided by the twelve municipal fire services and includes

- an examination of the core functions of each fire department;
- a situational analysis of the current fire services;
- options and strategies where the delivery of services can be enhanced or changed to improve efficiencies or effectiveness at either the local level, or partnering with other fire services, or broader county-wide level; and
- a financial analysis of the strategies and options.

To accomplish the changes described and to achieve the effectiveness that can save residents and businesses within the municipalities of the United Counties millions of dollars as a result of operating a more efficient, proactive fire service we recommend the following primary technical, operational, and organizational changes. A summary of all recommendations can be found in **Error! Reference source not found..**

c) Primary Technical, Operational, and Organizational Recommendations

1. Operational decisions should be based on data, particularly outcome data which will inform decision makers whether the activities of fire departments deliver value to the residents and businesses of the municipalities. The current 'response based' practices of the fire services deliver little benefit to the communities. Decisions about the distribution of funds and efforts between reactive response (emergency response to a wide range of incidents) vs. proactive response (education and prevention) need to be based on outcome data and they don't exist in Leeds and Grenville. Establishing a useful, robust data repository – and using it – is of immediate importance.

2. Fire services should work with other emergency responders, primarily the counties' paramedic services and paramedic dispatch service, to rationalize and reduce responses to medical incidents and motor vehicle collisions, again, based on activity and outcome data. The predominant activity of fire services is in responding to medical calls, motor vehicle accidents, and automatic alarms. Medical calls are sometimes responded to with multiple fire trucks, a practice for which there is no evidence of necessity but for which there is evidence that it [increases danger to the public](#).
3. There are few fires, yet 90% of budgets are spent on preparing for emergency response and rescues with relatively little allocated to saving lives by preventing incidents in the first place. The greatest activity of fire services should be uncompromisingly educating the public about fire safety and prevention, inspecting business and commercial establishments for fire code compliance, and enforcing safety practices.
4. Public education and prevention activities have to be aggressive. The current practices of having pamphlets available at fire stations or expecting the public to access fire department social media feeds such as Twitter or Facebook is mostly ineffectual. (<https://cjr.ufv.ca/journey-of-homesafe-community-risk-reduction-in-surrey/>)
5. We recommend a single, centrally managed, fire service for the counties and municipalities to take advantage of greater coordination of human and physical resources with a focus on the reduction of fire incidence, and subsequent reduction in cost and response activity.
6. We recommend
 - i. a single Director/ Chief of Fire Services for the counties with the proven ability to strategize and build an organization with an emphasis on protecting the public through prevention and education;
 - ii. two deputies or assistants to help the director achieve her goals;
 - iii. two administrative assistants to support the management team;
 - iv. five public education and prevention coordinators assisted by part time coordinators and volunteers;
 - v. a lead training instructor;
 - vi. a part time training instructor (assisted by volunteers);
 - vii. a full-time statistician to provide vital information required to achieve value for public money and best practice decision making;
 - viii. a professional fleet manager to administer, purchase, and coordinate all apparatus;
 - ix. a marketing manager, possibly part time, to assist the management team with aggressive promotion of fire safety;

The organizational recommendations above can be accomplished within the existing funding envelopes.

2. Current State

Establishing the need to change is the first step toward modernization. As a culture, we want the best possible emergency services scenarios to be in place; however, society is unlikely to embrace change if it believes the status quo is working. The emergency services network IS working. When the public call 9-1-1, emergency services personnel show up; therefore, it must be working. But the degree of how well emergency services functions is, for the most part, an unknown.

Historically, emergency services' performance has been measured by speed of response to the location of the person needing assistance. Almost all emergency services track and report how long it takes to arrive at the emergency. However, is that the most effective means of measuring the success of emergency services? The answer is "No".

Measuring response is one of the key performance indicators for emergency services but there are many other performance indicators that are much more important, such as the success of preventing emergencies through public education and prevention. Emergency response is a 'last resort' initiative that comes into play when public education and prevention efforts have not taken place or failed.

Yet, in many emergency services, response times and number of responses are the primary, if not only, performance indicators reported to municipal council and public. And, when those indicators don't meet targets, the very expensive options of more fire stations and equipment are proposed as remedies. While additional stations, equipment, and staff may allow quicker responses, they do not equate to improved outcomes.

[Provincial data of fatal fires](#) indicate, for those in proximity to an uncontrolled fire, death will likely occur within two to four minutes of a fire starting. Current response data also indicate most fire services are not arriving at the scene of the emergency within that four-minute timeframe.

Fire services in Canada refer to, or talk about, the three lines of defence against fire. The first line of defence is public education; that is, teach the public about fire risk and how to avoid fires. In other words, don't give a fire a chance to start. The second line of defence is prevention. Prevention includes education but it also encompasses inspections, enforcement within local and provincial legislation, and building code review. Again, the concept is to not have a fire occur. The final line of defence is suppression or put out the fire and rescue victims which also increases the risk to firefighters. This last line of defence means that the other two lines have failed.

Most reasonable people would surmise that educating about fire risk, and preventing a fire, is the most rational approach since it has a low impact on people, community, and property. But 90% of fire service budgets are spent on response and suppression; the failure line of defence. Does this financial and operational approach seem, somehow, illogical?

Information in Exhibit 1: Provincial Data from The Ontario Fire Marshal, shows that, on average, it takes between 6 and 9 minutes from the time that a call for help is received (known as an ‘Alarm’ in fire jargon) to arriving on the scene. It takes a lot longer in rural areas with volunteer services. That ‘arrival at the scene’ is when the fire truck’s wheels stop turning. It then takes an average of five to seven minutes to get water on the fire. That’s an average of 11 to 16 minutes from the time a call for help is received until water is applied to a fire.

Exhibit 1: Provincial Data from The Ontario Fire Marshal

	2011	2012	2013	2014	2015	
Total Number of Investigations	617	621	595	581	636	Cumulative Average
Total Number of Fatal Investigations	78	60	68	68	88	
Total Number of Deceased	86	68	78	79	94	
Total Number of Fatal Records Used	45	33	45	44	72	
Fatal Fire: Average Time from Alarm Time to Fire Department Arriving On Scene [hh:mm:ss]	00:06:14	00:06:40	00:07:24	00:09:48	00:08:11	00:07:45
Fatal Fire: Average Time from Fire Department Arriving On Scene to Water or Other Agent Being Applied to the Fire [hh:mm:ss]	00:04:55	00:06:20	00:05:54	00:06:50	00:05:36	00:05:53

Yes, we occasionally hear of firefighters rescuing someone from a burning building. Frankly, that is a rare, lucky occasion. And while we are all pleased to hear about those successes, we rarely hear anything further about hospitalization, burn treatments, resulting loss of income and enjoyment of life, or chronic obstructive pulmonary disease attributed to smoke inhalation.

This begs the question, “What can we do differently to enhance delivery of fire services and achieve positive outcomes”? The strategy of saving more lives through faster response is, at best, a weak argument. In rural areas this is particularly true given the reality of travel time impacted by road networks and physical barriers (rivers, lakes, rail lines).

Members of Council, municipal administrators, fire officials, and particularly responders must accept a culture change that embraces prevention and education as the best way to protect residents, visitors, businesses, neighbors, family, and friends – because emergency response is really an admission of failure to protect.

Councils should enable and encourage – no, insist, that fire service leaders objectively examine existing data capture systems to ensure all data required to best support change is being collected and analyzed. That isn't happening now, although that isn't specific to fire services in Leeds and Grenville. Technology that automatically captures and analyzes data is an important part of a change environment.

Education is the key to shifting the cultural expectations of the public. Municipalities must provide education to the public about fire-safe practices and activities and clearly explain the limits of emergency responders to be able to intervene in a timely manner. But this must be aggressive education. The prevalent practice of handing out pamphlets or conducting mail-outs is almost useless and costly for the value received. It is an expectation that the public will educate themselves (see this from The Journal of Safety Research <http://dx.doi.org/10.1016/j.jsr.2012.03.003>).

The public's perception of emergency services being there to save them is ill conceived and often based on television and movie portrayals, yet that perception is very vivid in the minds of most people in our society. We have done little to communicate with the public and explain that many fire service responders are volunteers, who are not at the fire station, but at home or their place of employment, and must travel to the fire station to get in the fire trucks and then travel to the location of the fire emergency.

We use the term 'volunteer' in this document to indicate firefighters who volunteer to respond to emergency incidents or attend training sessions but are not obligated to do so. Volunteers receive an honorarium or hourly compensation for their services.

This is not presented to slight volunteer firefighters, but to explain to the public the reality that exists, especially given that volunteer firefighters will do all things possible to save lives, prevent injuries, and reduce property damage

This perception of fire services being immediately available can be corrected by developing targeted messaging and educating the public. Another agency within the emergency response spectrum, Emergency Management, has been successful in educating the public on the need to be prepared in the event of an emergency, awareness of their surroundings, and developing a 72-hour emergency kit for

self-sustainability. But the Emergency Management message is delivered to the public in the form of advertising with the help of federal money. Fire departments use Facebook and Twitter, and if one takes the time to check the number of followers' fire departments have, they number in the hundreds, not thousands. Although fire departments efforts to "get out the message" through these media is admirable, it is passive, depends on the public to seek out fire safety information, and is not a good vehicle for educating large sectors of the public.

Developing and delivering fire and safety messages and programs to the public must be a priority. Fire services can work with local business and industry to convey fire safety and adjust messages based on the season.

Efforts applied to the [first two lines of defence](#) will reduce the need to continually expend precious resources in funding the third line of defence – that is emergency response – and avoid future costs for expanding response.

Modernization of the fire service, through greater concentration on education and prevention, will require a shift in culture across various components of society, including the public, insurance industry, politicians, municipal administration, and fire service members of all ranks.

d) Statistics Analysis Summary

Exhibit 1 indicates that in Ontario, on average, the duration from the time a call for help is received at a fire department until the first fire truck's wheels stop rolling at the curbside of the scene takes 7 minutes and 45 seconds. And, on average, from the time the wheels stop rolling until water is applied to the fire takes 5 minutes and 53 seconds. That totals 13 minutes and 38 seconds.

The same information applied to the fire services in Leeds and Grenville yields the information shown in Exhibit 2.

In Exhibit 2:

- The 'call handling time' is the time from when the telephone rings until the fire responders are paged or otherwise notified to respond. We have used two minutes for that factor as the 'call handling time' data received for this project is skewed by the inclusion of automatic aid and mutual aid calls ([explained later](#)).
- 'Turnout-and-travel time' represents the duration from when fire responders are notified of an incident until they arrive at the scene (wheels stop turning). The 75th percentile means that these are the measurements where 75 percent of incidents happen within the elapsed time shown but 25% take longer.
- 'Time to water or agent application' is the average time as determined by the Office of the Ontario Fire Marshal and shown in Exhibit 1.

Exhibit 2: Response Time of First Vehicle at the 75th percentile

2019 (hh:mm:ss)	Athens	Augusta	Brockville	Edwardsburgh Cardinal	Elizabethtown- Kitley	Front of Yonge	Gananoque	Leeds Thousand Islands	Merrickville	North Grenville	Prescott	Rideau Lakes Westport
Call Handling Time	00:02:00	00:02:00	00:02:00	00:02:00	00:02:00	00:02:00	00:02:00	00:02:00	00:02:00	00:02:00	00:02:00	00:02:00
Turnout + Travel Time (75th %ile)	0:14:40	0:21:30	0:07:46	0:17:01	0:20:59	0:21:55	0:11:54	0:33:20	0:18:58	0:16:35	0:12:37	0:21:46
Time to Water or Agent Application	00:05:53	00:05:53	00:05:53	00:05:53	00:05:53	00:05:53	00:05:53	00:05:53	00:05:53	00:05:53	00:05:53	00:05:53
Total Time	0:22:33	0:29:23	0:15:39	0:24:54	0:28:52	0:29:48	0:19:47	0:41:13	0:26:51	0:24:28	0:20:30	0:29:39

So, if at best, the Office of the Fire Marshal indicates that it takes an average of 11 minutes from the time a call for help is received until water is applied to a fire (Exhibit 1), and in most cases death occurs in about four minutes¹, then it is reasonable to conclude that a 15, 20, or 41 minute (Exhibit 2) response is not going to yield positive results for life or property (even though averages will be slightly lower than that).

An extensive analysis of fire service response within the United Counties of Leeds and Grenville for the years 2015 to 2019 is in [Appendix A](#). It shows that, because of the nature of the geography in Leeds and Grenville, responding to the scene of an incident and expecting to save life and property is, unfortunately, likely to be mostly futile. If ineffectuality is the result of response, despite the dedication and heroics of fire services and responders, perhaps an alternative – education and prevention – should be the primary method of fighting fires and saving lives.

¹ Office of the Chief Coroner, Verdict of Coroner’s Jury: Holly Harrison, Mari-Lee Towie, Benjamin Twiddy “We’d all like to imagine we’d be rescued.... We live in a world where we think (rescue’s) going to occur. But that’s not reality.” Rick Derstroff of the Office of the Fire Marshal (OFM) for Ontario. <https://nationalpost.com/opinion/christie-blatchford-teens-trapped-by-house-fire-never-had-a-chance-inquest-hears>

i. Call Volumes

During regular bi-weekly meetings with fire chiefs, and via email, several chiefs inquired how we arrived at the statistical conclusions, particularly the number of event responses, because the number of responses that are reported by fire chiefs to councils are much higher than those reported in this study. The explanation follows below.

Data Set We received 31,003 dispatch records, covering the period January 1, 2015 to May 30, 2020, from Brockville fire dispatch and The Town of Gananoque's fire department (29,861 from Brockville and 1,142 from Gananoque).

Brockville dispatches all fire services in The United Counties except for Gananoque Fire Service which is dispatched by the Gananoque Police. Since our intent was to measure response times, we were only able to use records that had response times recorded.

7,518 of the records we received did not have 'depart station' or 'arrived incident' times recorded which means they were not useable for measurement purposes. But

1,056 of the incidents that did not have 'depart station' or 'arrived incident' times recorded did have 'depart incident' times. The gaps in recorded times could occur for several reasons: A truck may not have left the station because there were an insufficient number of volunteers, the event or a particular truck was cancelled part way through the call, times were missed because the firefighters forgot to report their status or a dispatcher did not record the time, or other reason. This brought the number of useable records to 23,485.

Fire chiefs may report to council the total number of events to which the fire department responded, or the total number of trucks dispatched. Our purpose was to report performance based on first truck arriving or 'unique events'. So, our reporting is constructed on the number of events that have measurable times rather than the number of crews called in but who may not have left the station, or trucks responding, or number of calls including those that do not

Event Phases

Call Taking Time – the elapsed time from when the telephone rings at the dispatch centre to the time firefighters are alerted to an event;

volunteer firefighters are alerted by paging a pager, smartphone, radio, or other device;

career (full time) firefighters are alerted by station paging which may be simultaneously broadcast to personal pagers or communication devices;

Turnout Time – the elapsed time from when firefighters are alerted to the time of the first truck's departure from the station;

Travel Time – the elapsed time from departing the station to the curbside arrival at the event (this is not necessarily the same time as arrival at the event; as examples, reaching someone who has fallen down an embankment or in the case of a fire in a unit of a multi-story building will require additional time to arrive at the event);

Time on Scene – the elapsed time from when fire apparatus (the trucks) arrived at the scene until departing the scene;

Paged to back at station – the total from the time firefighters were alerted until they arrived back at the station after the event was complete.

have useable, measurable times. Therefore, the overall number of unique events that were valid for our measurement were 13,053 or 42.1% of the total records received.

Included in those 13,053 records were mutual aid calls. Mutual aid calls are events where a neighbouring fire service is called to assist because of the magnitude or complexity of an event. Mutual aid calls are not identified as such in the records. This is because the fire dispatch software is programmed to count the number of calls for each fire service – which is useful to individual fire departments – but masks the number of mutual aid calls and shows them as unique calls whereas they are part of an already recorded event. Therefore, the number of unique records (13,053) is likely lower because mutual aid calls result in double counting.

Nevertheless, we don't believe the number to be significant because most mutual aid calls are for assistance at fire events and, fortunately, fires are relatively infrequent. However, mutual aid calls do skew the data because the dispatch software records the time of the original call but logs the dispatch and travel time of the mutual aid trucks resulting in what appears to be long turnout times and long travel times. Since there is no way of readily identifying mutual aid calls, we manually checked and eliminated those we discovered due to protracted dispatch or travel times.

But we also found calls that were plainly incorrect such as a fire where four trucks left the fire station at different times, with the last truck leaving three minutes after the first, but all of them are recorded as arriving at the event at the same time, 17 minutes after the first departing truck. The event, though, was within two minutes of the fire station. We found a number of similar time inconsistencies and removed them from the dataset.

Exhibit 3 indicates the total number of vehicle movements in the 5-year time period studied (Column 3, Total Records) and the total unique records used to calculate response times (Column 6, Unique Events).

Exhibit 3: Rationalization of records used in Response Time Calculations

1	2	3	4	5	6
Municipality	Designation	Total Records	Records with missing depart station times	Available Records	Unique Events
Athens	Township	614	114	500	271
Augusta	Township	2,245	779	1,466	642
Brockville	City	8,121	928	7,193	4,298
Edwardsburgh Cardinal	Township	2,008	702	1,306	734
Elizabethtown-Kitley	Township	3,011	932	2,079	869
Front of Yonge	Township	1,014	298	716	355
Gananoque	Town	1,142	0	1,142	1,142
Leeds and Thousand Islands	Township	3,877	1,239	2,638	1,210
Merrickville-Wolford	Village	818	149	669	349
North Grenville	Municipality	4,105	1,388	2,717	1,393
Prescott	Town	1,108	259	849	659

1	2	3	4	5	6
Municipality	Designation	Total Records	Records with missing depart station times	Available Records	Unique Events
Rideau Lakes -Westport	Township - Village	2,940	730	2,210	1,131
Totals		31,003	7,518	23,485	13,053

- Column 3 of Exhibit 1 includes all records provided to the consultants for the period January 1st, 2015 to May 31st, 2020.
 - This column indicates the total number of vehicle responses during the five plus year period. In some cases, multiple vehicles would be sent to the same event.
- Column 4 indicates the number of records that did not have a 'Depart Station' time.
- Column 5, Available Records, is defined as useable records after removing those that did not have a 'Depart Station' time.
- Column 6, Unique Events, represent the number of events which had all critical times recorded and, therefore, were used for first vehicle measurement purposes. Multiple apparatus were sent to some of these unique events which accounts for the difference in 'records' (one record per apparatus) and events.

The Town of Gananoque does not show any records with missing 'depart station' times. The fire department's calls are received by the town's police department and the initial call time is recorded by the computer aided dispatch. Thereafter, all times are recorded in the notes section of the dispatch record but not captured in the police department's computerized dispatch. That information – including the notes – is sent to the fire department, and the times in the notes are manually entered into the fire department's record management system. The fire department has the opportunity, while completing the manual entry, to find missing times or estimate them. The outcome is that no records are missing critical times, but neither are we sure which are estimated.

Detailed response statistics can be found in [Appendix A](#).

e) Statistical Shortfall

One of the difficulties we experienced is a lack of outcome data. That is, what benefit occurs from each response, or type of response? These are frequently referred to as key performance indicators. As examples, what activities are performed at medical responses, how many firefighters arrive at the scene, was any care rendered? Similar assessments arise with respect to response to motor vehicle collisions. Was any service provided? Did the fire department act as highway blockers, did they extricate victims or clean the road? Was a fire extinguished?

[Research papers](#) indicate that fire response to most medical and motor vehicle incidents generate more risk in the response than benefit in attending but we were unable to tell that specifically within UCLG because outcome and activity records are not kept or accessible in an easily useable form. Neither is there any evidence that the county paramedic service and fire

services have established a formal working relationship on a committee basis so that decisions can be made as to the benefit of fire response to these incidents.

We recommend that the municipalities coordinate a single outcome data gathering methodology for all fire services.

We recommend that the county paramedic services and the fire services establish a Fire – Paramedic Service Coordinating Committee. Part of the purpose should be to collect evidence to determine if fire response to medical and motor vehicle incidents is required and under what circumstances.

Key performance indicators related to fire incidents should include

- the amount of fire suppression agent the fire service uses;
- the number of people on the lawn or driveway relative to the number of people who were in the building at the time of the fire;
- the time it takes for intervention;
- the degree of destruction that occurs after the fire service intervenes, or is the building a loss upon arrival?
- the amount of water used from the tanker as compared to another water source (data will eventually inform whether tankers need to be purchased and how many);
- whether fire fighting was defensive (from the outside) or firefighters had to enter the building (informs what kind of equipment is used, the frequency, and necessity to purchase).

The information above, and more, should be part of the outcome data kept in a central fire service record management system.

f) Response to Medical Incidents and Vehicle Collisions

[Appendix B](#) includes ample evidence to make us question the veracity of fire response to medical calls and motor vehicle collisions. Some fire departments in the counties send multiple trucks and volunteers to medical calls in good faith as the best possible service being provided, but it is done without substantiation that it improves the outcome for the patient.

Tiered response, that is, fire response to medical calls and traffic incidents has grown significantly in the past 20 years without evidence that it is beneficial, except in a few selected injury or illness categories. As an example, difficulty breathing, a medical complaint to which firefighters are commonly sent, is one of the ailments that waits the longest at hospitals before being transferred from the ambulance stretcher to hospital care. Is there a benefit in rushing a fire truck – sometimes more than one – to a difficulty breathing incident if the patient is likely to end up waiting at a hospital? The usual response to this question is that it's worthwhile because

firefighters could provide oxygen to the patient until an ambulance arrives. But the administration of oxygen isn't a benign act and is sometimes harmful. Please see information about application of oxygen [here](#) and [here](#), and this [research article](#).

Again, outcome data would inform whether such responses provide any benefit but there is no outcome data for the municipal fire services.

The information in [Appendix B](#) and supporting research papers indicate that the counties' paramedic services and the fire services should move forward to rationalize the need for fire response. An estimated \$280,000 in turnout costs could be avoided each year, at the upper end, as well as vehicle wear and tear. Some municipal fire services in the counties have moved to using utility vehicles or pickup trucks for medical response staffed with one or two firefighters. At the very least we encourage all fire services to adopt that practice.

The clinical utility of lights and sirens has been questioned since 1953, when studies revealed that 88 percent of patients arriving by ambulance did not require time sensitive medical management. A 1994 study found that limiting lights and sirens to 8 percent of transported patients did not increase the mortality rate. Furthermore, a 2014 study determined the number needed to treat with lights and sirens to prevent one patient's death is 5,000. With these findings, the safety, role, and proper utilization of lights and sirens must be evaluated and reconsidered. <https://www.acepnow.com/article/ambulance-lights-and-sirens-should-often-the-benefit-outweighs-the-risks/?singlepage=1&theme=print-friendly>

g) Educating the Public about Fire and Life Safety

Educating the public about personal responsibility regarding fire safety, and increasing their awareness of risk, is tough. Public education is the poor cousin of the fire service even though it is the most effective with respect to social and monetary value. While fire suppression lives in the big house on the hill and has the most expensive cars and trucks, public education is relegated to the small house on the flood plain no matter the false piety paid to it.



We admit that some of the fire stations are not as grandiose as in the illustration above, and some are getting tired. The hyperbole of that image is to demonstrate the differential between funds spent on the suppression side of fire service vs. the education and prevention side.

Section 2.1 of the Fire Prevention and Protection Act requires every municipality to establish a program that includes public education with respect to fire safety and certain components of fire prevention. In the United Counties, each municipal fire department is distributing fire and life safety information in each fire station, at various community events, or online via social media and/or the municipal website.

But the fire prevention act doesn't prescribe the extent of that education effort or a manner by which fire departments will assess its success or adjust if the programs do not display a positive outcome. Fire departments can meet the requirements of the Act simply by having pamphlets available at the fire stations. While some fire departments within the counties are making a significant effort towards education and prevention, others do not have the budget or resources to achieve more than the minimum. Most counties' fire departments have a Facebook or Twitter social media presence but, as admirable as that is, it still reaches only a few hundred people rather than thousands – and some of those Twitter and Facebook followers are likely firefighters. Fire departments don't have the budget to campaign for public fire education with the same success as Mothers Against Drunk Driving or Blue Box Recycling, but that is the best practice and baseline that should be strived for. The expenditure of several hundred thousands of dollars of well-placed education efforts in the counties should reduce fires and forestall or eliminate millions of dollars for the purchase of fire trucks, replacement of stations, and unmeasured social and monetary impact from fires. But, when budgets are tight public education, prevention, and possibly training are the three initial areas that are reduced.

Nevertheless, there are efforts towards public education and prevention in place in several municipalities. For example,

- Each fire department offers forms of public fire and life safety education and awareness such as a combined effort by three local fire departments to provide fire safety information in a local high school, work closely with local media outlets to provide fire safety messaging, diverse types of fire safety contests, issue a community fire safety calendar, and operate a coffee house fire safety Q&A.
- Some municipalities are involved in concerted public education initiatives utilizing commercial or handmade fire safety educational props such as model hazard-house displays.
- There are community partnerships with entities such as Enbridge Gas – Project Zero smoke alarm program, Canadian Tire Corporation fire safety days, Home Hardware for small scale funding, and hosting of prevention and public fire and life safety education projects reaching out to the broader community.
- Some fire services in the counties have a significant and well maintained social media presence for the dissemination of public fire and life safety education and other related

fire service messaging regarding burning permits, fireworks, children's fire safety contests and downloadable fire safety tips and fire prevention checklists.

- Some fire services also provide the public with information on a variety of topics such as extreme weather warnings, open air burn bans, pleasure boating safety, firefighter recruitment, female firefighter recruitment bootcamp, and public health (pandemic) issues.
- The Arson Prevention Program for Children (known as TAPP-C) is a fire prevention program that was developed to reduce the number of fires started by children's activities and it is available through several UCLG fire departments.
- Support is provided by some UCLG fire departments, but not all, for schoolteachers to deliver the National Fire Protection Association Learn Not to Burn fire safety curriculum for pre-school to Grade 2 elementary children.
- Fire extinguisher training for public and institutional employees is made available by all fire departments in UCLG using either their own training unit or the portable fire extinguisher training unit available through the UCLG Fire Prevention Committee network.

But improvements can be made to public education efforts pending a more cohesive county-wide approach.

- A decommissioned commercial, purpose-built fire safety house/trailer is stored at the Lyndhurst Training Centre. This unit should be replaced through a county wide capital budget initiative for coordinated fire and life safety education throughout the United Counties.
- An Ontario Fire Marshal's awareness program called *Older and Wiser Safety Program for Seniors*, and fire safety information related to cooking are offered by some UCLG fire services, they are not offered throughout the entire Counties.
- Some personnel involved in public fire and life safety education activities have not acquired a vulnerable sector check.
- Some staff involved in fire and life safety education endeavors have not yet certified to the following mouthful
 - NFPA #1035 Standard on Fire and Life Safety Educator, Public Information Officer, Youth Firesetter Intervention Specialist, and Youth Firesetter Program Manager Professional Qualifications.
- There is no indication that individual fire services have a quality management or assurance program in place to record and retrieve data and statistics to determine root cause analysis of incidents, or to create and implement effective fire and life safety education.
 - Cause determination is essential to establishing public education and prevention programs that meet the needs of the community. A one-size fits all approach, such

as delivering standard Office of the Fire Marshal programs, while useful, may not be the best value for money or most effective.

The OFMEM encourages municipal fire services to gather information “to demonstrate that a [fire and life safety education] program has:

- a. increased fire safety knowledge;
- b. improved occupant knowledge and fire safety behaviour and that these improvements reduced the impact of the evaluated fires;
- c. been responsible, in whole or in part, for fire loss reductions; and
- d. identified potential fire incidents which were prevented because of fire [and life] safety education delivered to the public.

We did not find evidence of such information gathering in the United Counties.

h) Fire Prevention

Section 2.1 of the Fire Prevention and Protection Act requires every municipality to establish a program that includes certain components of fire prevention. To comply with this requirement, each municipality has a municipal fire chief who is an Assistant to the Fire Marshal. Most municipalities within the counties have at least one designated Fire Prevention Officer. At least one municipality has established a fire prevention committee or team consisting of various members of the municipal fire department. Each municipality conducts fire safety inspections upon complaint or when requested to assist with code compliance (including any necessary code enforcement). However, having people appointed for the purpose of ‘being an Assistant to the Fire Marshal’ or having launched a fire prevention committee doesn’t mean that there is a correlation between such formation and a reduction in fires. The appointments or committees may or may not be having any impact. A lack of action – outcome records means that there is no way of showing whether these prevention programs are effective or have value for the activity.

Each fire department offers a form of a smoke and carbon monoxide alarm program but they vary.

- Each fire department offers a form of a required smoke and carbon monoxide alarm program. The City of Brockville has implemented a Residential Home Inspection program which incorporates the use of on-duty firefighters visiting assigned sectors of residences to ensure the presence of working smoke and carbon monoxide alarms.

Not all fire departments have implemented the delivery of fire code inspections on a routine or scheduled basis.

- Although each fire department conducts fire safety inspections upon complaint or request, as generally required under the Fire Prevention and Protection Act, not all have implemented the delivery of fire code inspections on a routine or scheduled basis for

occupancies² such as community halls, industries, factories, retail shops, or professional offices.

Annual inspections of occupancies with vulnerable residents

- Each municipal fire department which has, within their communities, vulnerable occupancies such as care homes, as designated by the Office of the Fire Marshal and Emergency Management, completes an annual inspection and fire drill, and maintains the appropriate OFMEM Vulnerable Occupancy website.

Variability in fire prevention resources

- Several fire services employ a full-time fire prevention officer while most utilize the services of a part-time/volunteer fire prevention officer or a fire prevention committee, or team consisting of interested and trained part-time/volunteer firefighters. Some fire services, during the time of this review, are in the process of re-organizing their fire prevention bureau, hiring new part-time Fire Prevention Officer(s) and/or, appointing new additional members of their department to their local fire prevention team.

Some form of fire investigations are conducted but we could not confirm that all fire department fire investigators hold an Assistant to the Fire Marshal identification card

- All fire services confirm that they conduct some form of fire investigation as required under the Fire Protection and Prevention Act (FPPA) and that they comply with the requirements regarding contacting the OFMEM as noted in *Fire Marshal's Directive: 2019-002 - Notification of Fires and Explosions*. Consultations indicate that each fire service in UCLG should verify, on a regular basis, that they have an adequate number of personnel who have acquired formal fire investigation training and certification. It has not been confirmed that all personnel who are assigned to fire prevention inspection duties and fire investigations (usually fire department officers) throughout UCLG are in receipt of an Assistant to the Fire Marshal identification card issued by the OFMEM.

Fire safety planning being conducted but not all chief fire officials have the requisite training.

- Fire safety planning and approval of formal Ontario Fire Code fire safety plans, under the auspices of 2.8 of the Ontario Fire Code, is being conducted by all fire services. However, consultations have not established that all Chief Fire Officials have acquired requisite training through the Public Services Health and Safety Association as outlined in Fire Marshal Communiqué 2014-15, in some cases due to ongoing organizational changes within the fire prevention division and/or cycling through of fire prevention team members. Efforts to acquire this training need to be strengthened.

² *Occupancy* means the use or intended use of a *building* or part of a *building* for the shelter or support of persons, animals or property. O. Reg. 332/12: BUILDING CODE under [Building Code Act, 1992, S.O. 1992, c. 23](#)

No confirmation that all operators of care homes have acquired recommended training.

- Additionally, consultations did not confirm that all Owners/Operators of designated occupancies such as Care Occupancies; Care and Treatment Occupancies; and Retirement Homes, regulated under the Retirement Homes Act, 2010 have been able to acquire training regarding the enhancement of fire safety in occupancies housing vulnerable Ontarians, as outlined in Fire Marshal Communiqué 2014-15.

No evidence that municipal fire services in UCLG conduct pre-incident planning.

- Consultations confirm that most fire services in UCLG conduct some form of site familiarity and/or awareness visits or tours of predominant building stock/occupancies during firefighter training sessions. However, we have not been able to find evidence that any UCLG municipal fire services conduct pre-incident planning as captured in NFPA # 1620 – Standard for Pre-Incident Planning, and subsequently make those plans available for use at fire and emergency responses, firefighter training, and fire safety inspections. This is an important initiative that should take place.

Pre-incident planning involves the collection and storage of critical site data and characteristics such as floor plans and potential hazards.

Some prevention and inspection staff have yet to acquire NFPA 1031 certification.

- Consultations did not confirm that all personnel involved in fire prevention and inspection activities have acquired certification to NFPA 1031: Standard for Professional Qualifications for Fire Inspector and Plan Examiner, or NFPA 1033: Standard for Professional Qualifications for Fire Investigator.

Data standards and quality assurance efforts must be implemented.

- Based upon a review of the fire and emergency incident data for UCLG there is no indication that there is a current means (quality assurance/management program) to extrapolate and retrieve consistent and measurable data and statistics for the purposes of determining root cause analysis of incidents and to be able to create and implement effective prevention/mitigation actions or programs.

According to the OFMEM Comprehensive Fire Effectiveness Model,

“all statistical and background information [gathered by a fire service] should be stated clearly and objectively to minimize the effects of factors unrelated to the actions of a fire department. For example, the number of [fires per thousand population](#)³ is an objective means to measure the rate of fire occurrence as it eliminates the impact of changes in

³ Please see [Appendix D](#) for 2019 incidents per population

population. However, fire loss statistics alone do not fully indicate the fire risk. A community's fire concerns should be described in terms that indicate an adequate understanding of the situation. For example, stating that careless smoking by nursing home residents between the hours of 2200-0600 is a serious fire problem in the community, will allow fire departments to target their programs more effectively”.

The value of gathering consistent and robust data is asserted by the OFMEM in their Fire Prevention Effectiveness Model – Position Paper, where they state that

For all fires within a fire department's jurisdiction, an accurate evaluation and Standard Incident Report should be completed. The [outcome] information gathered at fire scenes is essential to understand a community's fire losses. Improvements in firefighting, legislation, equipment, education, construction, and other factors that affect fire safety, are dependent on fire incident evaluations. It is, therefore, extremely important that sufficient and accurate information is collected.

We recommend that all fire departments gather information at fire scenes to help evaluate the effectiveness of fire department programs. For example, assessing occupant behaviour and causes will enable a department to implement a public fire safety education program targeting similar causative activities.

Community Risk Analysis Importance

- Early completion of factual, objective, and accurate community risk analyses will be useful to ascertain risk throughout the counties and help to determine the distribution of inadequate public education and fire prevention assets.
- Economies of scale, through determined efforts to pool resources and avoid duplication of efforts across the counties, would be a strategic method to successfully bring about fiscal efficiencies in association with the delivery of services.
- Ongoing assessment of program effectiveness and resources, through constantly evolving statistical and quality assurance review processes, will further guide the UCLG fire services in efforts to improve fire safety.

A municipality that exists on July 1, ... must complete a community risk assessment no later than July 1, 2024.

*ONTARIO REGULATION 378/18
FIRE PROTECTION AND
PREVENTION ACT, 1997*

i) Fleet

- Fire services in the United Counties of Leeds and Grenville (UCLG) have a total of [88 apparatus](#) and numerous smaller equipment that require regular maintenance and servicing. Most fire service vehicles are replaced on a twenty year or less cycle.

88 fire trucks
31 pickup trucks & small vehicles
8 boats
8 all-terrain vehicles
16 trailers

- An estimated five new vehicles are being introduced into the County each year, which means municipalities in Leeds and Grenville are spending approximately one and half million dollars annually on new vehicles. Maintenance cost on a vehicle usually begins in year two of ownership and continues to rise annually until the vehicle is disposed.
- Municipalities may realize a savings by contracting with a small number of mechanical and maintenance service providers to monitor and repair fire trucks (apparatus maintenance hubs). Additional savings might occur by including other municipal vehicles into the common contract. The logistics of moving fire trucks for service would have to be considered.
- Municipalities with the ability to provide the service should also be encouraged to do so on a cost recovery basis.
- All county municipalities would benefit from having common specifications and requirements for fire service vehicles and establishing longer term contracts with manufacturers.
- Municipalities should investigate and implement technology to track fleet utilization. More specific to fire services, county-administered fleet software would enable a more collective picture of apparatus efficiency, would assist with planning vehicle replacement or retirement and redeployment between municipalities, and will assist in determining if vehicles are being used effectively and appropriately.
- Municipalities should develop useful lifecycles and monitoring for all vehicles and equipment which would assist with the creation of capital expenditure forecasts out to twenty years. Shorter apparatus life cycles – for example, replacing pumpers at a seven-year benchmark instead of 15 or 20 years – might result in higher trade in or resale value and be fiscally advantageous to acquire new fire apparatus with improved firefighting technology safety features.
- The development of a common specification for each vehicle type will ensure consistency and an understanding of costs associated with each and assist in planning and cost forecasting of future purchases.

- The purchase of stock apparatus versus developing individual specifications will result in savings.
- Municipalities should use Request for Proposal methods rather than developing specifications and tenders for apparatus and equipment. Manufacturers build every day and have knowledge on trends that local firefighters and managers don't.
- Coordinated oversight of purchasing assures that requirements are aligned with council approved service delivery levels.
- Long-term contracts should be considered to benefit from economy of scale and improved efficiency by reducing efforts associated with administering the purchasing process. Current practices may result in a department operating a number of apparatus from different manufacturers, as well as having additional costs related to the administration of separate contracts.
- Every vehicle purchased should be managed to support both the amortization and planning of its replacement at the end of its useable life.
- Fleet monitoring technology should be used to evaluate individual vehicle cost and operation.
- Vehicle purchase agreements should include a training program, to be delivered by the manufacturer, at the destination. This will ensure the employer meets its requirements under Occupational Health & Safety legislation.

'Stock' apparatus means vehicles manufacturers have in stock or used for demonstration at conventions rather than developing a custom vehicle. It's like buying a car from the stock on the lot versus ordering one. The cost for a stock vehicle is usually thousands less than a custom model.

j) Equipment

- In addition to mobile apparatus, the fire services in UCLG operate a wide range of related equipment, including boats, utility task vehicles (all-terrain vehicles), air compressors, self-contained breathing apparatus, chain saws, communication devices and portable pumps.
- Firefighters also have personal protective equipment that must be maintained and replaced as required (bunker gear and helmets have life spans).
- While a dollar value is not noted specifically, each department buys equipment and supplies annually. There are opportunities that will result in improved buying power through economy of scale, but currently aren't exploited.
- Municipalities within the county should coordinate the purchase of fire department related resources. Savings may be realized if economy of scale purchasing is developed and would result in consistent and alike equipment across all fire stations.
- Effective leadership is required to support the processes, oversight, and guidance of purchasing practices to ensure requests for equipment are aligned with the delivery of

municipal and county approved core services. Common procurement practices supported by the municipalities will permit objectivity, transparency, and accountability.

- A communications strategy must be developed and delivered to the equipment users so they understand why changes take place (whether or not they are pleased with those changes).
- Establishing and maintaining common service standards will enable the public and internal stakeholders to determine expectations and or limitations of the fire service.
- The effective use of business cases supporting purchases allows senior administration to objectively consider requests. New technology and or alternatives to purchases should be considered throughout the entire process.
- Common equipment specifications that are appropriate for the circumstances and within the goals of the fire service should be an objective that takes precedence over personal preference.
- Promotion and acceptance of longer-term contracts will realize savings, not only for product price but also from reducing staff and administration time during the procurement process.

Other best practices related to equipment and apparatus that should be put into practice, preferably on a county-wide basis include

- The development of standing agreements to support the acquisition of both consumable and capital supplies.
- Developing effective measures to manage and track the utilization of each piece of equipment.
- Establishing standard usage cycles and lifespans to support the safety of personnel and manage any potential liability of the municipalities and county.
- Redistribution of equipment to stations and municipalities based on usage cycles and lifespan to ensure best value of equipment.
- All equipment should be supported with the proper and documented training of personnel.
- A cooperative, or county-led, just in time delivery approach, in an effort to reduce any emergency procurement, stockpiling, or warehousing of supplies. Alternatively, there may be times when a cooperative purchasing program can centrally purchase and warehouse supplies such as personal protective equipment.
- Effectively manage purchasing of legislated or required items, as some items have life spans imposed by regulation or industry standards (bunker-gear, helmets have shelf life).
- Hire a central fleet manager to administer, purchase, and coordinate all apparatus.

ii. Personal Preference

Interviews and bi-weekly meetings with fire chiefs revealed that several chiefs have tried to coordinate purchasing, but without success, partially due to firefighter preference in equipment; for example, gloves, helmets, and other turnout gear.

We agree that it is good practice to ask staff about the performance and fit of bunker gear and other equipment but eventual consensus amongst a group of fire departments will lower cost and effort. And, if that coordination came at the county level, even less effort by individual fire chiefs would be required to procure equipment. As one fire chief said to us “When I started as a firefighter, I wasn’t given a choice of which truck to drive or the color of my turnout gear”.

iii. We’ve tried that ...

We need to address the “we’ve tried something similar and it didn’t work” elephant in the room. It’s a statement we heard several times. When someone says that in opposition to an idea, or just as a negative comment – particularly if the person saying it holds a position of authority – most of us simply nod or otherwise acknowledge the statement but avoid saying that the person’s one experience doesn’t mean that new ideas will not work. To respond with a counter-comment of that nature seems contradictory or confrontational to most of us. But all the person’s anecdote shows is that his or her one experience was not successful.



There can be many reasons for the anecdotal example not to have worked: not invested in the change; not properly planned; not followed up; insufficient time or resources; etc. We said early in this report that emergency services are a business and need to be run like one. Some private organizations operate by the seat of their pants and are very successful; many go bankrupt. The changes we are suggesting have to be properly evaluated but we are confident in saying that there are millions of dollars in efficiency and effectiveness to be gained across the UCLG with change.

3. Organization and Governance

This report recommends reorganizing the individual municipal fire services into a single counties-wide fire department to include the ten-member municipal fire departments and the Towns of Prescott and Gananoque, and the City of Brockville.

Recommendations are also made that

- there should be an intense focus on fire prevention and public education to avoid the costs of maintaining a robust fire response organization;
- Gananoque should be dispatched by Brockville which will assist consistency and efficiency in record keeping and mutual aid response;
- the number of responses to incidents should be refined and reduced, based on data, particularly to medical incidents, motor vehicle collisions, and automatic alarms. These three categories make up the majority of fire department responses;
- reduce the number of apparatus and firefighters that are dispatched to some incidents; again, medical incidents, motor vehicle collisions, and automatic alarms are examples. [Research](#) supports this recommendation;
- reduce the number of fire stations based on data; although we recognize this as a controversial recommendation, some fire stations respond to only three to five fires a year, sometimes fewer. Municipalities would be unlikely to establish new fire stations to respond to this number of fires annually, so we discuss the merits of continuing the operation of stations that respond to few incidents;
- as it becomes time to replace records management technology or within three years, whichever is sooner, fire services should switch to the same platform as is being used by the Brockville dispatch agency.
- technology and information systems; for example, tablets and record management systems for public education and prevention reports, should be used to reduce human effort and forestall the pressure to hire additional administrative staff or deputies.

Currently, fire services in The United Counties of Leeds and Grenville are organized as ten volunteer departments, one composite (career and volunteer firefighters) and one full-time career department. Collectively, the departments respond from 24 fire stations and are governed by 12 municipalities each of which is participating in this review.

[Response coverage mapping](#) indicates that the current station locations result in some coverage overlap, and the area's geography contributes to protracted emergency response. In addition, it is important to note that access to volunteer firefighters (residence, places of work during a 24/7 timeframe) must be considered in station placement to ensure adequate human resources when needed.

[Data](#) provided to Pomax indicates several stations responding to a small number of structure fire calls annually, in fact, as few as 3 -5 calls. Although there are other types of calls to which a fire department may respond, the primary function continues to be the reduction of occasion and severity of fires. Unfortunately, data such as the timing of firefighter arrival, overall number of firefighters, or the time an effective firefighting force is assembled on scene is insufficient to determine the degree to which the response was adequate and whether there was a reasonable benefit to the response.

While a direct cost/benefit analysis of any of these responses cannot be made currently due to a lack of data, a cost benefit analysis can be easily done upon achieving a more comprehensive, consistent, data collection. It should be easy, for example, to determine if there is value in the current response design and method or if decommissioning a rarely used station and accepting a slightly longer response time from another station would provide the relatively same benefit.

Some of the municipal fire departments were founded 100 or more years ago when, typically, a major fire prompted a group of civic minded community members to organize a community response to a fire emergency. These initial volunteer fire departments evolved from bucket lines to hand operated pumps, to horse drawn steam pumps and eventually to today's sophisticated fire apparatus. Responsibility for fire services funding changed from a group of citizens donating their time and dollars, to subsidization by insurance companies, and then by municipalities as they took over responsibility for the fire services.

The evolution of fire protection services from the origins of small, volunteer-based organizations made up of committed community members means that the local fire department has become an honored, respected community asset with strong emotional ties and local identity. In many cases the local, "volunteer" fire department is held onto closely even when the facts do not support its continuing in the existing organizational model. None of this is meant to imply that the fire department administration or firefighters are not committed to serving their communities in a dedicated and caring manner. The question is "can the fire service continue in the current organizational and governance model and continue its important work while meeting the challenges of today and the future"?

... there are few fires, but fire department activities continue to focus on response.

In fact, there are few fires, but fire department activities continue to focus on response. It is similar to armies preparing to fight the last war rather than training for a new enemy.

The role of firefighters has changed significantly over time and particularly in the last four decades. This has resulted in challenges in the recruitment and retention of firefighters in the volunteer sector. These additional roles and responsibilities have impacted firefighters, officers, chief officers, and municipal administration in wide ranging and demanding ways. Provincial regulations, firefighter health and safety guidelines, legal responsibilities, and liabilities, labour law and regulations, and budgeting pressures to address rising operating and capital costs all demand the time of senior fire administrators.

In the volunteer/part-time sector, where the fire chief is often a part-time position with full time employment elsewhere, these growing demands make it nearly impossible to focus on a proactive approach to community fire safety emphasizing public education and prevention. The fallback is for volunteer fire organizations to do their best with emergency response resources that may or may not meet the needs and circumstances of the community.

In many areas of the United Counties the reality is that emergency response is limited in terms of speed and capability and, therefore, the public's expectation of rapid response should be clearly communicated by municipal governments. Emphasis should be placed on educating the public about fire and life safety and highlighting individual and personal responsibility that residents should adopt for fire and injury prevention.

So, we must face the difficult question of asking if the current organizational and operational model of fire protection services in The United Counties of Leeds and Grenville works to benefit public fire safety in an efficient and effective way? The answer is that we haven't found any evidence to conclude that it does.

Are there alternatives that can provide advantages over the current state that make the best use of financial and human resources? Is there data to support other options? Is the information available to municipal administrators and councilors to allow fact-based decisions that may challenge the current delivery model? The answer is yes even though some data is meagre at this point. Here's an example:

The cost of running a fire department is astronomical. Pumper trucks cost \$350,000 (and up), aerial trucks cost more than \$1 million. [...] [Y]et dollar losses due to fire continue to increase. Of all the measures we've taken and money that has been spent, our fire death rate is almost the worst in the western world. Does this add up? If we are really in this business to save lives and property, why are we fighting change? [...] We must continue to be creative and accept the fact that life in the fire service is an evolution. I really believe that more fire prevention and public education is the key to our communities' best chance against fire. [...] We have come a long way [...] in this area of emergency preparedness through education from a global perspective; however, we must see the future with fewer fires through the same approach (2011:6).

Ken Sheridan, Captain of Fire Prevention in Norfolk County Ontario

Exhibit 4 indicates 14-year fire activity for a fire station in a UCLG municipality (we've avoided using the name of the municipality). Over a 14-year period there were three years where fire damage exceeded about \$10,600. That means that in 11 out of 14 years total fire losses were estimated at approximately \$10,600 or less. There were no fire-related injuries or deaths in 14 years.

Exhibit 4: 14-year Activity Example for Local Municipality Fire Station

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
LOSS Fires (fires with injury, death, or \$ damage only)	2	2	2	1	3	3	2
Total injuries (civ +ff)	0	0	0	0	0	0	0
Total fatalities (civ +ff)	0	0	0	0	0	0	0
Total dollar loss	\$1,250	\$200	\$150	\$1,000	\$9,500	\$10,600	\$87,000
	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14
LOSS Fires (fires with injury, death, or \$ damage only)	1	1	3	1	1	2	3
Total injuries (civ +ff)	0	0	0	0	0	0	0
Total fatalities (civ +ff)	0	0	0	0	0	0	0
total dollar loss	\$1,000	\$9,000	\$120,000	\$1,000	\$2,000	\$51,500	\$3,500

Is it reasonable to maintain a fire station, a pumper, and a tanker – representing one-million dollars or more in capital investment, and a cadre of volunteers, for essentially 1 to 3 small fires a year? Or are there alternatives such as a rapid response unit or a small incident unit housed in a municipal or county facility – rather than a separate fire station – and backup from the next closest fire station? As much as some of us may say that alternatives would be a good fit, more information is needed:

- What was the overall response time to these fires?
- How many fire fighters arrived and at what time point?
- Was the number of firefighters and sequence of arrival adequate and effective?
- What efforts were required to extinguish the fires?
- Did any rescues take place?
- Was mutual aid employed?
- How long did mutual aid response take?
- How many mutual aid fire fighters arrived and at what time points?

These, and answers to similar specifics about every incident, which are easily gathered and recorded in computer-based record management systems, would fully inform fire service and municipal decisions about the right size and configuration of fire stations.



This is a small incident unit. Similar configurations are used throughout the United Kingdom and Scandinavia where fires are researched, and data carefully recorded and analyzed. Municipalities in the UK and other countries employ teams of statisticians and analysts to help determine asset requirements and staffing levels.

We recommend a single, centrally managed, fire service for the counties and municipalities to take advantage of greater coordination of human and physical resources with a focus on the reduction of fire incidence, and subsequent reduction in cost and response activity. As dedicated and concerned as we believe the current fire chiefs to be, it is highly unlikely that the municipal fire services will be able to coordinate and cooperate as a group of 12 to achieve the efficiencies and effectiveness that can be accomplished through a single counties-based fire protection organization.

We recommend

1. a single Director/ Chief of Fire Services for the counties with the proven ability to strategize and build an organization with an emphasis on protecting the public through prevention and education;
2. two deputies or assistants to help the director achieve her goals;
3. two administrative assistants to support the management team;
4. five public education and prevention coordinators assisted by part time coordinators and volunteers;
5. a lead training instructor;
6. a part time training instructor (assisted by volunteers);
7. a full-time statistician to provide vital information required to achieve value for public money and best practice decision making;
8. a professional fleet manager to administer, purchase, and coordinate all apparatus;
9. a marketing manager, possibly part time, to assist the management team with promoting fire safety;

10. the creation of a Fire Services Transition Steering Committee, to facilitate the move from the current fire protection model to the new fire department model. The transition team would consist of senior administrators (CAOs) of the partnering municipalities. The Steering Committee would assist and provide guidance to the fire management team and the Director/ Chief as she moves forward.

The Steering Committee might also

- provide a platform to address community concerns regarding local fire protection;
- receive information from the Director/ Chief regarding the rationalization of fire station locations, equipment, apparatus, and personnel required in the new model;
- provide relevant facts and analysis to community members and partnering local councils to encourage support for the new model;
- enable strategy for the evolution to the new model considering such things as consolidation of purchasing systems, rationalization of station locations, staffing, equipment, and apparatus;
- provide support to the new fire administration team regarding the primary roles of the first two lines of defense (prevention and enforcement and public education) considering that there is likely to be opposition to the paradigm;
- work with impacted council(s) with a draft Establishment and Enabling By-law reflecting the needs and circumstances of the communities served by the fire department

The first-year costs of the recommended organization are estimated as shown in Exhibit 5, below.

Exhibit 5: First Year Estimated Costs of a County-wide Fire Service

Position	Complement	Salary	Part Time	Sub-Total	Benefits	Total
Director/Chief	1	\$160,000		\$160,000	\$42,816	\$202,816
Deputy	2	\$130,000		\$260,000	\$69,576	\$329,576
District Chief	2	\$115,000		\$230,000	\$61,548	\$291,548
Public Education / Prevention	5	\$109,000		\$545,000	\$145,841	\$690,841
Public Education / Prevention Part Time	1.2		\$130,800	\$130,800	\$35,002	\$165,802
Training Instructor	1	\$100,000		\$100,000	\$26,760	\$126,760
Training Instructor Part Time	0.5		\$50,000	\$50,000	\$13,380	\$63,380
Statistician	1	\$110,000		\$110,000	\$29,436	\$139,436
Fleet Manager	1	\$115,000		\$115,000	\$30,774	\$145,774
Marketing Manager	1	\$60,000		\$60,000	\$16,056	\$76,056
						\$2,231,988

“There is nothing more difficult, more perilous, or more uncertain of success, than to take the lead in introducing a new order of things.” Machiavelli

Exhibit 6: Current Staffing Resources at Fire Services within the United Counties

Service	Chief	Deputy	Administration	Fire Prevention	Training Officer (TO)	Volunteer Firefighters	Full Time Firefighters	Dispatchers	Part Time Dispatchers	Full-time	Part-time
	9.4	6.8	9	5.2	1	490	30	4		24	
Brockville	1	1	1	2	1	N/A	28	4		6	N/A
Elizabethtown-Kitley	1	1	1	0.5	Deputy	67	N/A			3	N/A
Rideau Lakes	1	1	1	0.5	Deputy	100	N/A			3	1
Leeds/Thousand Islands	0.6	1	1	Volunteer	Deputy	75	N/A			2	1
Front of Yonge	0.6	Volunteer	0.5	Volunteer	Volunteer	27	N/A			N/A	2
Gananoque	1	none	1	1	Chief, FTFF & vols	30	2			3	N/A
North Grenville	1	1	1	1	Deputy & Vol TO	40	N/A			4	N/A
Prescott	0.6	0.6	1	Volunteer CFPO & team of Volunteer FPOs	Deputy	27	N/A			1	2
Edwardsburgh-Cardinal	1	Vol	0.5	By chief	Chief's responsibility	43	N/A			1	0.5
Augusta	1	0.6	0.5	0.2	Training Committee	25	N/A			1	3
Merrickville- Wolford	0.6	0.6	0.5	Team of volunteer FPOs	Deputy's responsibility	25	N/A			N/A	3
Athens	Vol	Vol	0.5	Vol	Deputy & team of TOs	31	N/A			N/A	1

Information received from approximately 75% of the municipalities reveals an amount in the order of \$2,130,750 allocated to chiefs and senior officers. Our expectation is that the anticipated annual costs for senior staff of a county-wide fire service will be offset by current funding. Additionally, a reduction in responses to a substantial number of calls to which evidence indicates need not be responded will offset up to ~\$280,000 in volunteer costs.

Expected fleet and purchasing coordination will reduce the need for apparatus purchase and provide rationalization of stations while improving public safety and prevention activities. We expect, within three years, an additional \$2,000,000 or more in capital costs will be avoided.

k) Effectiveness and Efficiencies of a Single Fire Department

Development of policies, procedures, and proactive community fire safety efforts under the current organizational model of fire protection in the United Counties requires the consent and support of 12 separate fire administration teams and councils. The administration of the fire department under a single administrative team and council would support the development and enforcement of consistent policies, procedures, operational guidelines, administration of financial and human resource matters, and oversight of departmental activities.

The following benefits will be realized from a single fire service administration:

- Fire prevention and public education efforts will be strategically targeted and delivered as required throughout the counties and, over time, emergency response will be streamlined into an effective and efficient model.
- Development of expertise would occur and consistent application of prevention and public education activities, reflecting the needs of all residents across the county, would improve.
- Decisions on the need for and placement of apparatus would be determined by an administrative team with an understanding of county-wide response requirements and with responsibility for the full coverage area.
- Fire and technical response expertise and capability (water rescue, motor vehicle collision extrication, hazardous materials, etc.) will be rationalized across the region to prevent overlap or absence of required response capabilities. Currently there is some level of cooperation on services within the 12 fire departments. A single administrative team would better determine and coordinate various emergency response needs and develop and administer the optimal response models.
- Economies of scale through bulk purchasing of apparatus, small equipment, and materials would be supported under a single administrative team.
- Consistent collection of relevant data for response, prevention, and public education purposes would be supported through employment of a statistical professional and utilized optimally by a single administration team.

We envision that

- The single fire department would be governed by an apolitical board consisting of representatives from the community and municipalities. OR
- Reporting structure for the Director/ Chief would be through the Chief Administration Officer for the United Counties of Leeds and Grenville to the county council.
- Funding for the fire department would be determined through a financial analysis and the political process which may include considering the need for area ratings determined by population, property assessment values and/or response needs.

l) A Final Word about Governance and Organization

It should be clear that these recommendations do not suggest that stations should be closed or apparatus reduced immediately, although there is ample evidence to lean in that direction. These recommendations are about instituting an organizational structure with professional support that can gather evidence and make fact-based decisions, improve effectiveness, and reduce costs.

4. Recommendations

We recommend

1. a single, centrally managed, fire service for the counties and municipalities to take advantage of greater coordination of human and physical resources with a focus on the reduction of fire incidence, and subsequent reduction in cost and response activity. As dedicated and concerned as we believe the current fire chiefs to be, it is highly unlikely that the municipal fire services will be able to coordinate and cooperate as a group of 12 to achieve the efficiencies and effectiveness that can be accomplished through a single counties-based fire protection organization;
2. a single Director/ Chief of Fire Services for the counties with the proven ability to strategize and build an organization with an emphasis on protecting the public through prevention and education;
3. two deputies or assistants to help the director achieve her goals;
4. two administrative assistants to support the management team;
5. five public education and prevention coordinators assisted by part time coordinators and volunteers;
6. a lead training instructor;
7. a part time training instructor (assisted by volunteers);
8. a full-time statistician to provide vital information required to achieve value for public money and best practice decision making;
9. a professional fleet manager to administer, purchase, and coordinate all apparatus;
10. a marketing manager, possibly part time, to assist the management team with promoting fire safety;
11. the creation of a Fire Services Transition Steering Committee, to facilitate the move from the current fire protection model to the new fire department model. The transition team would consist of senior administrators (CAOs) of the partnering municipalities. The Steering Committee would assist and provide guidance to the fire management team and the Director/ Chief as she moves forward;
12. that there should be an intense focus on fire prevention and public education to avoid the costs of maintaining a robust fire response organization;
13. municipalities should immediately concentrate on a strategy to coordinate a single outcome data gathering methodology for all fire services, and plan to improve data and information so that whatever decision jurisdictions might make with respect to fire service response models can be taken based on fact, rather than an assumed understanding of the efficacy of fire service response;
14. that all fire departments gather information at fire scenes to help evaluate the effectiveness of fire department programs. For example, assessing occupant behaviour and causes will enable a department to implement a public fire safety education program targeting similar causative activities;

15. that as it becomes time to replace records management technology or within three years, whichever is sooner, fire services should switch to the same platform as is being used by the Brockville dispatch agency;
16. that technology and information systems; for example, tablets and record management systems for public education and prevention reports, should be used to reduce human effort and forestall the pressure to hire additional administrative staff or deputies;
17. that Gananoque should be dispatched by Brockville which will assist consistency and efficiency in record keeping and mutual aid response;
18. that the county paramedic services and the fire services establish a Fire – Paramedic Service Coordinating Committee. Part of the purpose should be to collect evidence to determine if fire response to medical and motor vehicle incidents is required and under what circumstances;
19. that the number of responses to incidents should be refined and reduced, based on data, particularly to medical incidents, motor vehicle collisions, and automatic alarms. These three categories make up the majority of fire department responses;
20. reducing the number of apparatus and firefighters that are dispatched to some incidents; again, medical incidents, motor vehicle collisions, and automatic alarms are examples. [Research](#) supports this recommendation;
21. reducing the number of fire stations based on data; although we recognize this as a controversial recommendation, some fire stations respond to only three to five fires a year, sometimes fewer. Municipalities would be unlikely to establish new fire stations to respond to this number of fires annually.
22. that, in conjunction with recommendations 8, 13, 14, 15, 16, 18, 19, and 20 the counties, municipalities, and fire service adopt a primary strategy and culture of detailed data and information capture, analysis, and management to assist the judicious delivery of needed services – but not every service – and implement workforce control strategies to avoid volunteer fatigue by responding, to the extent possible, only to those incidents that offer proved value to the community. Long term planning relies upon detailed and accurate knowledge of response and outcome benefit history, and good planning requires historical reporting to identify trends and future needs to support a materials management improvement strategy (number of trucks and other assets, and how to employ them).
23. that the counties and municipalities implement a task force comprising several Chief Administrative Officers and fire chiefs, some financial officers, and possibly citizen representatives to pursue the recommendations within the report. The role of the task force would be to examine report details, operational issues, implementation challenges, and how the recommended organization would function. The consulting team would remain available to answer questions and offer explanations.

5. The Fire Chiefs' Response to the Report Recommendations

The fire chiefs offered some comments, both to the consultant team and, separately, to the UCLG Steering Committee, which require serious consideration. A summary of their comments follows below.

- **Prevention** – the chiefs agree there is a need to place greater emphasis on fire prevention and education.
- **Joint Procurement** – the chiefs agree that joint procurement leads to standardization, though when they spoke to the suppliers, they stated the savings may only be around 5%.
- **Operating procedures** – the chiefs agree that common operating procedures will lead to better practices. And they agreed that there is a need to review the type of responses, such as to motor vehicle accidents and medical assistance, and to improve responses and/or determine priorities.
- **Training** – the chiefs suggest that consistent training is taking place across the counties, and that there are economies of scale occurring.
- **Automatic aid** – the chiefs recognize that although multiple mutual aid agreements are in place across the counties, automatic aid would mean the closest fire department responds and should improve response times.
- The chiefs indicate that costs will likely increase in a single, regional service structure. Some chiefs suggested costs would be in the millions of dollars and held out Kawartha Lakes and City of Hamilton amalgamations as two examples of costs increasing.
- The fire chiefs expressed concerns about
 - the reaction of the volunteers. Volunteer firefighters and their associations have done considerable fundraising and the chiefs are concerned about how the assets will be dealt with, especially those purchased by the volunteers and/or their associations and/or the community;
 - the Fire Underwriters' Survey and ratings impact that might translate to higher insurance premiums for homeowners (i.e., closing a remote fire station or one close to another station);
 - public relations if fire vehicles/equipment are reduced in some areas, regardless of the number of fires. The public is only expecting a fast response;
 - why only the option of a regional fire service is recommended.
- The fire chiefs recognize there has been a lack of oversight, especially as it pertains to them working together and the need to formalize key performance indicators, measurements, accountability, working cohesively, collaboration.
- The chiefs feel all opportunities exist within current structures and if there is no cost savings, why change?

In response to the chiefs' comments, the consulting team understands the chiefs' perspectives and concerns and so we offer the following observations.

The Costs: the chiefs indicate costs will increase within a single fire service scenario and specifically indicated Kawartha Lakes and the City of Hamilton as examples of cost increases. And the chiefs are right, but it is crucial to understand why costs increased in those two communities and why the circumstances are significantly different to those in the United Counties. It is important to recognize that the amalgamations in Kawartha Lakes and Hamilton started in the early 2000s, almost 20 years ago.

Pomax interviewed the Kawartha Lakes Fire Chief (David Guilbault) who was present at the time of that amalgamation (since retired), and current Hamilton Chief David Cunliffe who was part of the Hamilton Fire Service at the time of consolidation but not in a senior role. Both chiefs indicated that the consolidations resulted in improved emergency services although there were lessons to be learned. It is hard to identify costs and savings specific to amalgamation in those two locations net of changes that would have occurred if amalgamation hadn't happened, but Chief Guilbault indicated that costs increased due to heavy investment in acquiring bunker gear (some existing departments were still wearing trench coats and rubber boots) and replacing 37-year-old front line pumpers, milk and gasoline trucks used as fire service tankers, and old 'bread trucks' being used for rescue vehicles. We are not aware of similar scenarios being in place in Leeds and Grenville. Chief Guilbault also mentioned that, due to relocation and rationalization of fire apparatus, Kawartha Lakes went from "something like 82 fire apparatus to 60" over a few short years.

Chief Cunliffe stated that "...the community is better served by the amalgamated department. Hamilton covers 1200 sq. km and has stations that are career, composite, and fully volunteer depending on the local needs. The amalgamated department is better able to adjust with changing needs in the communities. Determining how a station is staffed depends on risk assessment for that coverage area."

Full time firefighter salaries increased in some communities encompassed in the Kawartha Lakes and Hamilton amalgamations. However, there are few full time firefighters in Leeds and Grenville for that scenario to have a substantial impact. It is possible that some volunteer stipends will increase but that has been taken into account in our assessment and is expected to be offset by a reduction in responses and response costs, purchasing efficiencies, and asset rationalization.

So, did costs increase? Yes, but not simply by virtue of consolidation. Costs were a result of insufficient apparatus and equipment which had to be replaced, and the organizational and staffing configuration in Kawartha Lakes and Hamilton. Those scenarios cannot be wholly translated to the United Counties; the design is different.

Volunteer Reaction: The chiefs are concerned about negative volunteer reaction to an organizational change. This is possible but as Hamilton Fire Chief David Cunliffe commented "volunteers will stay if they still feel valued by the new department and management ... departments

relying on volunteers have to find ways to adapt to the volunteer's lifestyle and not insist the volunteer adapt to the department's system.

And, we have to ask the question of why the assumption is that all volunteer reaction will be negative. Some volunteers might find positive aspects of working within a larger organization, others may be neutral to the change. Chief Guillbault noted that "there was significant 'buy in' from the firefighters who saw the improvements in the services, training, and equipment being acquired."

There is also a perception that volunteers will adversely react to a 'loss of identity'; that is, they may feel that they are no longer serving their local community. In Kawartha Lakes the identity of local fire services was maintained through signage on fire stations and fire apparatus, and in Hamilton it was almost 17 years post amalgamation before fire trucks no longer indicated the station to which they were assigned.

Fire Underwriters Survey: the fire chiefs indicate insurance costs may go up for some homeowners because of closing a fire station. The Fire Underwriters Survey is one of the most misunderstood entities in the fire industry. Pomax has been trying to find objective evidence of the impact of Fire Underwriters ratings on insurance costs since 2011. We have interviewed large insurance companies like State Farm (before it was purchased by Desjardins) to ask whether they use Fire Underwriters Ratings and were told that State Farm has its own underwriters and doesn't use Fire Underwriters; we have interviewed large commercial brokers such as Prolink which stated that if they use Fire Underwriters it is one of many factors considered in setting insurance rates; and we have interviewed representatives of the Fire Underwriters organization who were refreshingly honest in indicating that their business is to rate buildings or municipalities and sell that information to insurance companies or 'member companies' as they expressed it.

Opta (the company that owns Fire Underwriters) indicates that the insurance companies that subscribe to FUS information use the product to

- identify opportunities for writing new business,
- achieve a financially manageable concentration of property risks,
- review loss experience in various rating territories,
- price policies, offer coverages, and establish deductibles for individual properties.

Fire Underwriters stated, during our interview and within their online presence, that the actual cost of insurance, as experienced by individual policy holders, is determined by each insurance company's underwriting plans, and is affected by a number of considerations such as

- location of the risk with respect to distance from recognized water supplies (hydrants, etc.), and distance from the responding fire station,
- claims history – such as fire, wind, hail, crime and water damage claims (as relates to policyholder and/or geographic area),

- independent broker's insurance markets and their loss experience for that business demographic,
- types of coverage such as basic fire; comprehensive "all risks"; etc.,
- type of construction; exposures; etc.,
- types of occupancies; contents; etc.,
- applicable policy deductible and/or policy sub-limits,
- age of risk building and code compliance with respect to building, fire and electrical codes,
- alarm systems,
- specialized content coverage such as fine arts, scheduled articles, jewelry, etc.,
- loss control inspection findings,
- exposures to natural hazards such as earthquake, wind, snow and flood, and,
- prevailing property insurance market conditions.

In conclusion, we are aware, as a result of direct conversation with FUS representatives in the past few years, that a minor change in classification is likely to have little effect on individual insurance costs particularly considering that "Many insurers will subsequently group these classifications into "town grades" of protected, semi protected, and unprotected categories" and we have not been able to determine the impact on property owners due to ratings changes. However, we will not deny the possibility.

Public relations if fire vehicles/equipment are reduced in some areas, regardless of the number of fires. The public is only expecting a fast response: The whole premise of our report is that quick response of a sufficient cadre of firefighters to a fire is almost impossible in Leeds and Grenville due to the geographic nature of the area – and the data confirms that statement. The report supports educating the public as to how to be fire safe and avoid fires starting, and not to depend on dedicated firefighters to save them and their property. Education, prevention, and public relations are central factors of the recommended organizational change.

Why is the option of a regional fire service the only option recommended? Earlier versions of this report included several options but we withdrew them because none of them had the scale necessary to achieve the organization and savings shown in the single organizational design. One option; that is, continuing the existing organizational structure but hiring a UCLG fire commissioner and a data analyst, would have increased costs or, at best, not provided savings or other advantages. We discussed other options with the steering committee but independently decided against including them because the organizational recommendation constitutes the greatest benefit to the counties and public.

In closing we offer a final recommendation because the consultant team recognizes that we have proposed considerable changes to the fire services. We recommend that the counties and municipalities implement a task force comprising several Chief Administrative Officers and fire chiefs,

some financial officers, and possibly citizen representatives to pursue the recommendations within the report. The role of the task force would be to examine report details, operational issues, implementation challenges, and how the recommended organization would function. The consulting team would remain available to answer questions and offer explanations.

6. Appendix A: Fire Services Statistical Analysis

a) Introduction

The purpose of this statistics report is to explain the distribution and type of emergency events to which fire departments in the United Counties respond, the associated response times, and to set the stage for a current state report which compares the resources available to the need of each municipality.

The purpose of the statistical and event analysis was also to determine the time it takes for each phase of an emergency event. These phases are shown in the Event Phases text box.

Call Volumes During regular bi-weekly meetings with fire chiefs, and via email, several chiefs inquired how we arrived at the statistical conclusions, particularly the number of event responses, because the number of responses that are reported by fire chiefs to councils are much higher than those reported in this study. The explanation follows below.

Data Set We received 31,003 dispatch records, covering the period January 1, 2015 to May 30, 2020, from Brockville fire dispatch and The Town of Gananoque's fire department (29,861 from Brockville and 1,142 from Gananoque).

Brockville dispatches all fire services in The United Counties except for Gananoque Fire Service which is dispatched by the Gananoque Police. Since our intent was to measure response times, we were only able to use records that had response times recorded.

7,518 of the records we received did not have 'depart station' or 'arrived incident' times recorded which means they were not useable for measurement purposes. But 1,056 of the incidents that did not have 'depart station' or 'arrived incident' times recorded did have 'depart incident' times. The gaps in recorded times could occur for several reasons: A truck may not

Event Phases

- **Call Taking Time** – the elapsed time from when the telephone rings at the dispatch centre to the time firefighters are alerted to an event;
 - volunteer firefighters are alerted by paging a pager, smartphone, radio, or other device;
 - career (full time) firefighters are alerted by station paging which may be simultaneously broadcast to personal pagers or communication devices;
- **Turnout Time** – the elapsed time from when firefighters are alerted to the time of the first truck's departure from the station;
- **Travel Time** – the elapsed time from departing the station to the curbside arrival at the event (this is not necessarily the same time as arrival at the event; as examples, reaching someone who has fallen down an embankment or in the case of a fire in a unit of a multi-story building will require additional time to arrive at the event);
- **Time on Scene** – the elapsed time from when fire apparatus (the trucks) arrived at the scene until departing the scene;
- **Paged to back at station** – the total from the time firefighters were alerted until they arrived back at the station after the event was complete.

have left the station because there were an insufficient number of volunteers, the event or a particular truck was cancelled part way through the call, times were missed because the firefighters forgot to report their status or a dispatcher did not record the time, or other reason. This brought the number of useable records to 23,485.

Fire chiefs may report to council the total number of events to which the fire department responded, or the total number of trucks dispatched. Our purpose was to report performance based on first truck arriving or 'unique events'. So, our reporting is constructed on the number of events that have measurable times rather than the number of crews called in but who may not have left the station, or trucks responding, or number of calls including those that do not have useable, measurable times. Therefore, the overall number of unique events that were valid for our measurement were 13,053 or 42.1% of the total records received.

Included in those 13,053 records were mutual aid calls. Mutual aid calls are events where a neighbouring fire service is called to assist because of the magnitude or complexity of an event. Mutual aid calls are not identified as such in the records. This is because the fire dispatch software is programmed to count the number of calls for each fire service – which is useful to individual fire departments – but masks the number of mutual aid calls and shows them as unique calls whereas they are part of an already recorded event. Therefore, the number of unique records (13,053) is likely lower because mutual aid calls result in double counting.

Nevertheless, we don't believe the number to be significant because most mutual aid calls are for assistance at fire events and, fortunately, fires are relatively infrequent. However, mutual aid calls do skew the data because the dispatch software records the time of the original call but logs the dispatch and travel time of the mutual aid trucks resulting in what appears to be long turnout times and long travel times. Since there is no way of readily identifying mutual aid calls, we manually checked and eliminated those we discovered due to protracted dispatch or travel times.

But, we also found calls that were plainly incorrect such as a fire where four trucks left the fire station at different times, with the last truck leaving three minutes after the first, but all of them are recorded as arriving at the event at the same time, 17 minutes after the first departing truck. The event, though, was within two minutes of the fire station. We found a number of similar time inconsistencies and removed them from the dataset.

We noted 1,709 responses classified as being dispatched from 'Administrative' stations. Administration responses were explained to us as being *"... for non-emergency responses. The occurrences where the admin unit goes to a scene multiple times, could be for support purposes. (rehab supplies, meals etc.)"* However, 1,255 of the 1,709 Administration responses (explained to us as non-emergency designations) were the same types of emergency events to which fire trucks respond and were often the first arriving vehicle for medical calls. It's possible

that some administration calls were for the support purposes intended by this classification, but many were emergency responses. For data clarity, we suggest responses should be classified as emergency response or non-emergency rather than via a virtual station.

Table 1 indicates the total number of vehicle movements in the time period studied (Column 3, Total Records) and the total unique records used to calculate response times (Column 6, Unique Events).

Table 1: Rationalization of Records Used in Response Time Calculations

1	2	3	4	5	6
Municipality	Designation	Total Records	Records with missing depart station times	Available Records	Unique Events
Athens	Township	614	114	500	271
Augusta	Township	2,245	779	1,466	642
Brockville	City	8,121	928	7,193	4,298
Edwardsburgh Cardinal	Township	2,008	702	1,306	734
Elizabethtown-Kitley	Township	3,011	932	2,079	869
Front of Yonge	Township	1,014	298	716	355
Gananoque	Town	1,142	0	1,142	1,142
Leeds and Thousand Islands	Township	3,877	1,239	2,638	1,210
Merrickville-Wolford	Village	818	149	669	349
North Grenville	Municipality	4,105	1,388	2,717	1,393
Prescott	Town	1,108	259	849	659
Rideau Lakes -Westport	Township - Village	2,940	730	2,210	1,131
Totals		31,003	7,518	23,485	13,053

- Column 3 of Table 1 includes all records provided to the consultants for the period January 1st, 2015 to May 31st, 2020. This column indicates the total number of vehicle responses during the five plus year period. In some cases, multiple vehicles would be sent to the same event.
- Column 4 indicates the number of records that did not have a 'Depart Station' time.
- Column 5, Available Records, is defined as useable records after removing those that did not have a 'Depart Station' time.
- Column 6, Unique Events, represent the number of events which had all critical times recorded and, therefore, were used for first vehicle measurement purposes. Multiple apparatus were sent to some of these unique events which accounts for the difference in 'records' (one record per apparatus) and events.

The Town of Gananoque does not show any records with missing 'depart station' times. The fire department's calls are received by the town's police department and the initial call time is recorded by the computer aided dispatch. Thereafter, all times are recorded in the notes section of the dispatch record but not captured in the police department's computerized dispatch. That

information – including the notes – is sent to the fire department, and the times in the notes are manually entered into the fire department’s record management system. The fire department has the opportunity, while completing the manual entry, to find missing times or estimate them. The outcome is that no records are missing critical times, but neither are we sure which are estimated.

Definitions

In the charts that follow

- **Incidents by Month** indicate the number of incidents that occurred in the year and month specified.
- **Incidents by Day** are calculated over the period of a year. Each day occurs a minimum of 52 times a year which means that if 15 incidents are shown as happening on a certain day, that means the average occurrence is $15 \div 52 = 0.29$ incidents on the day shown.
- **Incidents by Hour** are calculated over the period of a year. Each hour occurs 365 times a year which means that if 10 incidents happened in a particular hour, the average occurrence is $10 \div 365 = 0.028$ incidents in that hour during the year.

The data indicates that some fire services and fire stations have low activity levels and few fires. This is positive news for the community but also raises the question of whether a fire station is needed to respond to fewer than three to five fires per year or if alternatives are available rather than trying to maintain a station, apparatus, staff, and training. Certainly, it is questionable if a municipality would establish a fire station for this number of fires if one did not presently exist.

Individual fire service data are shown on the following pages.

Tables 2: Key Time Indicator Charts

Call Handling (Some times are skewed by mutual aid data)												
	Call Handling Time (telephone rings to responders alerted)					90th Percentile						
	Athens	Augusta	Brockville	Edwardsburgh	Elizabethtown-Kitley	Front of Yonge	Gananoque	Leeds Thousand Islands	Merrickville	North Grenville	Prescott	Rideau Lakes Westport
2015	0:02:57	0:03:46	0:03:20	0:03:41	0:04:13	0:03:33	0:01:26	0:05:27	0:03:07	0:04:49	0:03:34	0:04:37
2016	0:01:20	0:02:16	0:01:56	0:02:16	0:02:35	0:02:17	0:01:59	0:03:11	0:01:46	0:04:26	0:02:04	0:02:48
2017	0:02:09	0:02:47	0:02:07	0:06:26	0:02:35	0:02:19	0:01:57	0:04:52	0:02:44	0:04:28	0:02:23	0:04:09
2018	0:02:50	0:02:47	0:02:03	0:04:18	0:03:16	0:02:34	0:01:05	0:05:07	0:02:47	0:04:31	0:01:55	0:03:25
2019	0:02:18	0:02:15	0:01:46	0:02:12	0:03:07	0:05:05	0:05:39	0:03:56	0:04:38	0:04:15	0:02:12	0:03:35
2020	0:01:56	0:02:15	0:01:26	0:07:30	0:04:09	0:01:37	0:02:26	0:04:21	0:06:40	0:03:48	0:01:34	0:04:29

First Vehicle Response												
	Turnout Time (responders notified to depart station)					90th Percentile						
	Athens	Augusta	Brockville	Edwardsburgh	Elizabethtown-Kitley	Front of Yonge	Gananoque	Leeds Thousand Islands	Merrickville	North Grenville	Prescott	Rideau Lakes Westport
2015	0:10:45	0:10:44	0:03:17	0:08:36	0:09:25	0:13:44	0:01:51	0:10:39	0:09:36	0:08:33	0:08:20	0:10:09
2016	0:11:17	0:09:35	0:03:19	0:08:46	0:09:01	0:12:55	0:01:33	0:11:24	0:07:53	0:06:44	0:08:37	0:10:47
2017	0:09:36	0:11:04	0:03:17	0:10:00	0:10:05	0:12:47	0:04:47	0:11:08	0:08:10	0:05:49	0:09:16	0:10:39
2018	0:07:44	0:12:31	0:03:20	0:09:46	0:10:38	0:13:49	0:08:06	0:11:43	0:10:04	0:06:40	0:08:48	0:11:19
2019	0:08:07	0:12:31	0:03:16	0:08:50	0:11:43	0:12:34	0:07:55	0:11:53	0:10:39	0:08:22	0:08:22	0:11:36
2020	0:09:41	0:12:30	0:03:27	0:11:05	0:10:19	0:13:13	0:07:51	0:10:36	0:08:02	0:07:00	0:07:33	0:09:36

First vehicle Response													
	Travel Time (depart station to arrive incident)					90th Percentile							
	Athens	Augusta	Brockville	Edwardsburgh	Elizabethtown-Kitley	Front of Yonge	Gananoque	Leeds Thousand Islands	Merrickville	North Grenville	Prescott	Rideau Lakes Westport	
2015	0:10:17	0:10:51	0:05:34	0:10:39	0:10:45	0:12:13	0:08:21	0:12:40	0:14:35	0:10:53	0:06:24	0:16:06	
2016	0:15:38	0:11:58	0:05:42	0:11:04	0:12:16	0:12:03	0:08:39	0:14:50	0:11:53	0:10:49	0:06:09	0:18:31	
2017	0:07:29	0:12:22	0:06:06	0:11:01	0:12:24	0:09:58	0:08:10	0:12:13	0:10:57	0:10:54	0:06:19	0:16:14	
2018	0:13:47	0:14:04	0:05:55	0:10:31	0:12:04	0:11:17	0:09:24	0:12:32	0:13:53	0:11:42	0:06:29	0:13:42	
2019	0:10:17	0:13:25	0:05:41	0:11:22	0:13:24	0:12:24	0:07:14	0:11:21	0:10:42	0:10:31	0:06:45	0:14:51	
2020	0:18:59	0:12:31	0:05:34	0:12:27	0:12:41	0:14:48	0:06:58	0:12:39	0:14:51	0:11:11	0:03:59	0:15:45	

First vehicle Response													
	Travel Time (depart station to arrive incident)					75th Percentile							
	Athens	Augusta	Brockville	Edwardsburgh Cardinal	Elizabethtown-Kitley	Front of Yonge	Gananoque	Leeds Thousand Islands	Merrickville	North Grenville	Prescott	Rideau Lakes Westport	
2015	00:07:26	00:08:05	00:04:19	00:07:52	00:08:58	00:08:27	00:06:03	00:18:26	00:09:50	00:08:15	00:04:20	00:09:19	
2016	00:07:35	00:08:40	00:04:36	00:08:18	00:09:42	00:10:11	00:05:40	00:22:43	00:08:31	00:07:45	00:03:34	00:10:51	
2017	00:06:02	00:09:11	00:04:44	00:07:54	00:10:15	00:08:38	00:05:04	00:22:13	00:08:00	00:08:06	00:03:46	00:10:44	
2018	00:07:33	00:09:01	00:04:37	00:08:14	00:06:48	00:07:18	00:05:00	00:19:59	00:09:36	00:08:23	00:03:49	00:09:03	
2019	00:06:33	00:08:59	00:04:30	00:08:11	00:09:16	00:09:08	00:03:59	00:21:27	00:08:19	00:08:13	00:04:15	00:10:10	
2020	00:07:34	00:09:02	00:03:53	00:08:23	00:10:35	00:09:15	00:03:25	00:15:12	00:11:04	00:07:49	00:02:33	00:09:54	

First Vehicle Response												
	Median Time on Scene All Incidents											
	Athens	Augusta	Brockville	Edwardsburgh Cardinal	Elizabethtown-Kitley	Front of Yonge	Gananoque	Leeds Thousand Islands	Merrickville	North Grenville	Prescott	Rideau Lakes Westport
2015	00:22:58	00:30:07	00:17:03	00:20:47	00:24:40	00:19:59		00:09:00	00:20:35	00:14:59	00:12:00	00:24:52
2016	00:26:37	00:25:03	00:16:15	00:15:54	00:24:17	00:18:14	incident	00:10:00	00:25:18	00:13:51	00:14:13	00:24:38
2017	00:22:32	00:33:35	00:17:50	00:18:36	00:24:54	00:19:40	time	00:08:53	00:25:48	00:15:03	00:12:54	00:22:47
2018	00:21:25	00:26:30	00:16:37	00:21:57	00:24:41	00:23:45	not	00:08:51	00:28:35	00:14:20	00:15:09	00:22:32
2019	00:18:09	00:32:28	00:16:35	00:17:59	00:23:44	00:22:21	tracked	00:08:24	00:29:20	00:12:56	00:13:42	00:23:37
2020	00:26:32	00:17:33	00:15:20	00:21:15	00:24:11	00:20:26		00:09:13	00:28:37	00:14:05	00:14:33	00:24:59

Table 3: Time from Phone Rings to Agent Application

2019	Athens	Augusta	Brockville	Edwardsburgh Cardinal	Elizabethtown-Kitley	Front of Yonge	Gananoque	Leeds Thousand Islands	Merrickville	North Grenville	Prescott	Rideau Lakes Westport
Call Handling Time	00:02:00	00:02:00	00:02:00	00:02:00	00:02:00	00:02:00	00:02:00	00:02:00	00:02:00	00:02:00	00:02:00	00:02:00
Turnout + Travel Time (75th %ile)	0:14:40	0:21:30	0:07:46	0:17:01	0:20:59	0:21:55	0:11:54	0:33:20	0:18:58	0:16:35	0:12:37	0:21:46
Application Time (water or foam)	00:05:00	00:05:00	00:05:00	00:05:00	00:05:00	00:05:00	00:05:00	00:05:00	00:05:00	00:05:00	00:05:00	00:05:00
Total Time from Phone Rings to Agent Applied (75th percentile)	0:21:40	0:28:30	0:14:46	0:24:01	0:27:59	0:28:55	0:18:54	0:40:20	0:25:58	0:23:35	0:19:37	0:28:46

Call Handling Time was set at two minutes because call handling times in the data are skewed due to mutual aid calls combined with infrequent occurrence.

Application of Agent time based on Ontario Fire Marshal statistics (next page).

**Average Response Time
 Fatal Fires**
 Data taken from 2011 to December 31st, 2015.

	2011	2012	2013	2014	2015	Overall Average
Total # Investigations	617	621	595	581	636	
Total # Fatal Investigations	78	60	68	68	88	
Total # Deceased	86	68	78	79	94	
Total # Fatal Records Used	45	33	45	44	72	
Fatal Fire Average Time from Alarm Time to FD OnScene Time	00:06:14	00:06:40	00:07:24	00:09:48	00:08:11	00:07:45
Fatal Fire Average Time from FD OnScene Time to App of Agent Time	00:04:55	00:06:20	00:05:54	00:06:50	00:05:36	00:05:53

Above Stats does not include the following:

- First Nation Territories
- Non Fire Fatalities
- Files with incomplete data fields
- No application of Agent Applied

iv. Remote Alarms and Carbon Monoxide Alarms

- There were 4,695 remote alarms in the UCLG records for the period January 2015 to May 31, 2020 (Gananoque was not included). 4,450 had valid times for measurement.
- In approximately 27% of alarms trucks were on scene for less than 10 minutes. Of the 164 incidents that trucks were on scene for more than an hour, 68 were for CO alarms.
- There were 300 remote smoke alarms in the 5-year 5-month record period. For 199 of those (66%), trucks were on scene for less than 20 minutes.
- The low on-scene time for trucks responding to remote alarms and smoke alarms likely indicates that those alarms turned out to be false. Increased public education, and if that fails, penalties, may reduce the frequency of alarms.
- The fire services should use any outcome data they may have to find any alarms that turned out to be fires or CO, determine injury or circumstances, and modify their response guidelines as appropriate.
- Fire services should consider modifying their response to alarms when there is no secondary information to suggest a fire is occurring.
- A reduction in the number – and perhaps type – of trucks responding, where data supports that change, could reduce risk to the public and firefighters.

Table 4: Time at Scene - Alarms

Arrived Incident to Depart (Time on Scene)	Total Alarms by Type 2015 - 2020	< 10 minutes	10 < > 20 minutes	20 < > 30 minutes	30 < > 1 hour	> 1 hour
Remote Alarms Including CO	4450	1230	1573	767	717	164
		27.64%	35.35%	17.24%	16.11%	3.69%
Remote Smoke Alarms	300	99	100	38	38	7
		33.00%	33.33%	12.67%	12.67%	2.33%

7. Appendix B Tiered Response for Municipal Policymakers

a) Foreword

This paper is about data at fire services, more specifically, the lack of it and the effect on decision-making – a situation not uncommon to fire services. When you read this discussion paper your first thought might be that it is about tiered response; in fact, the title *is* Tiered Response for Municipal Policy Makers. But make no mistake, it is about data. Without adequate data – by that we mean detailed, robust, and coordinated with paramedic services – current response practices will continue without evidence that they are accomplishing anything other than anecdotal success.

It's possible that even with adequate data little may change from the existing response protocols and frequency. Elected officials might decide to let current response practices continue – or change them – for many legitimate reasons but, importantly, those will be informed decisions.

So, this is about data even though the specific discussion applies to tiered response. But the same discussion is germane to many other aspects of emergency service delivery including traffic accidents, automatic alarms, and – yes – even fires.

Over the next four and a half pages this foreword offers a brief background to the tradition of fire response to medical incidents and traffic accidents while the balance of the discussion paper addresses the subject in greater detail.

v. The Practice of Fire Response to Medical Incidents

'Practice' can be defined as "to do something customarily" and fire response to medical incidents is indeed a practice; it has become customary. But it, as any practice, should be reviewed and questioned from time to time so that the best decisions can be made about what form it should take, or whether it should be refined. This is sometimes described as "best practice determination".

Most fire departments conduct community risk assessments, simplified risk assessments, or comprehensive risk assessments and depend on historical frequency and severity of incidents as a means of determining the probability of future occurrence. If fire departments accept that this is a valid means of forecasting the probability of future incidents then the same principle should apply to tiered response or response to other non-fire related emergencies. The corollary is that if data indicates that fire services are not arriving at least two minutes ahead of paramedics, or that upon their arrival they are not required to provide life-saving intervention, then it is debatable whether there is advantage in continuing the practice. The key to this determination is data but fire services, generally, have sparse facts.

Robust data gathering is important because without it, municipal decision makers have no way of measuring whether response by fire departments to medical incidents and traffic accidents

offers any benefit to victims. Whatever the advantage might be has to be balanced against additional risk to the public and firefighters from very large fire vehicles travelling at higher than normal speeds.

High quality data assumes particular importance in tiered response as this practice is now universally considered to be part of a system of community emergency medical response within the broader concept of "Evidence-Based Medicine (EBM)." In a nutshell, EBM – now central to the practice of emergency medicine and intensive care (among many other specialties) -- demands that we should only do things to patients which is supported by rigorous scientific evidence of their benefit. In other words, don't start – or continue – to do things for which insufficient evidence exists.

The proof which Evidence-Based Medicine demands arises from one thing and one thing only – high quality data.

Evidence-Based Medicine has turned emergency medicine and its subspeciality, pre-hospital paramedic care, inside out over the last 15 years. Many interventions, practices, drugs, and medical devices, including many considered "standard of care", have vanished after being found to have no medical value, and even to unexpectedly cause lethal harm to patients.

The sobering lesson of EBM, a lesson of direct and specific relevance to tiered response and therefore to this paper, is that even intuitively appealing practices may be worthless or harmful. Moreover, in the absence of evidence of benefit, unproven practices will be ordered discontinued by the physician Medical Directors who control pre-hospital care.

An example familiar to most fire chiefs is the practice of giving free-flow oxygen to nearly every pre-hospital patient fire and EMS crews encountered. It was thought to be benign, and sometimes helpful, and if not, it at least showed the patient and family that "something" was being done. In fact, Evidence-Based Medicine has now proven that the practice – even in classic cardiac chest pain – is outright harmful unless the need for it is proven by blood oxygen saturation measurement.

So, it is not enough to "believe" or be "convinced" that a practice is benefit, nor even that we have done it for a long time "with no complaints". We must have the data to prove it or say good-bye to cherished roles, practices, and interventions.

vi. The History of Fire Response to Medical Emergencies

Over the past 50 years, what we now call Evidence-Base Medicine has slowly shaped the design of EMS systems, and through that, of fire service response to 9-1-1 medical incidents. The vexing and resilient problem of poor survival from Out-of-Hospital Cardiac Arrest (OHCA) was

the central focus of EMS design, and now a vast and excellent scientific literature guides best practices.

The science proved that extremely rapid response was critical to patient survival, and that simple interventions such as CPR compressions and use of automated cardiac defibrillators – like those carried on fire trucks or seen in wall cabinets at airports and shopping malls – were the key.

In the 1970s and early 1980s, it was commonly assumed that if rescuers – either firefighters or EMS paramedics – were to arrive in under 9 minutes in at least 90% of incidents, that survival would be maximized. As a result, this 9-minute standard (often referred to as “8:59”) emerged as a wide-spread “standard” for EMS response.

Again, Evidence-Based Medicine proved this wrong. Now, it is known that intervention must occur not in 4, 6, or 8 minutes, but as close to instantaneously as possible after a patient collapses, and no response time is “good enough.” Accordingly, citizen CPR, public access to defibrillators, and the fastest possible community response by firefighters or EMS paramedics is critical.

To shorten the time to intervention, firefighters across North America were increasingly asked to respond to EMS calls. In many US communities, fire departments assumed operation of the entire ambulance system.

In Canada, tiered response (different terminology might be used depending on province and jurisdiction) has a long history in some communities. For instance, citizen calls made directly to the Toronto Fire Department (TFD) for help in medical emergencies grew rapidly after World War Two. In 1952, with great reluctance, the TFD replaced District Chiefs’ sedans with six stretcher-equipped light trucks (essentially ruggedized station wagons) and dispatched these vehicles to such calls. Successive Fire Chiefs bitterly complained in the TFD Annual Reports that this was a misuse of fire resources, but the practice stuck.

In 1973, response by the closest pumper replaced District Chief responses. In a few Canadian cities, the fire service has directly operated EMS ambulances. Now ambulance service in Canada is, with rare exceptions, provided by a mix of provincial, municipal, and contracted private EMS agencies, and fire service involvement is largely restricted to tiered response to the most urgent of EMS incidents.

vii. Fire Response to Medical Emergencies and Motor Vehicle Accidents in Ontario

In the early 1990s the Province of Ontario made a policy decision to promote the concept of fire department response to medical incidents in cases where ambulances were delayed beyond a locally determined time mark. The initiative was prompted by a municipality in the Greater

Toronto Area that was lobbying for increased EMS presence in its community. To avoid providing more ambulances to this municipality, and perhaps precipitating similar requests and associated costs in other locations, the Ministry of Health promoted “response support” by fire departments. This was during a time when all EMS costs were funded by the province.

The concept was originally intended to call upon fire services only when ambulances were unusually delayed – for example; 15 minutes or more. But, over a few years, fire services were being called out for any incident where the initial evaluation was “chest pain, difficulty breathing, uncontrolled bleeding, or unknown”. The problem was that at one time up to 87% of all calls for ambulance service fell into these categories because of a dispatch prioritization tool that lacked sensitivity and specificity, and because the prevailing viewpoint at the provincial level was that “it is better to err on the side of safety”. More about dispatch prioritization tools can be found later in this paper. Currently 70 – 75% of requests for ambulances fall into one of the four categories noted above.

Considering that fewer than 5% of patients are considered to be time sensitive emergencies, and less than 2% of EMS patients ever require interventions such as cardiopulmonary resuscitation (CPR), bag-mask ventilation, automated external cardiac defibrillation, and the application of tourniquets to control peripheral bleeding, it is questionable why fire departments are being sent to medical incidents which often make up 40 – 50% of their call volume.

Nevertheless, this paper is about data and why it is important to have the correct data sets upon which decision makers can determine to what degree local fire services should respond to medical incidents and traffic accidents or, in fact, any other type of emergency. Good data assists to determine types of training, number of volunteers required, equipment, apparatus, and a full scope of other decisions that should be taken to effectively operate a fire service.

viii. If We Save One Life...

In discussions respecting fire service response to medical incidents and traffic accidents reasoning such as “if we save only one life, it will be worth it” is offered as a rationale for continuing the practice. Would that still be a good reason if a fire vehicle responding to an incident becomes involved in an accident and someone is killed or injured? Or if one of the four, six, or more volunteers responding to a general callout for a medical event becomes involved in an accident while responding to the fire station?

ix. The Responders

The information and questions posed in this discussion paper are not intended to diminish the role of volunteer or career firefighters who are always available for us to call on in case of fires, other emergencies, or when we don’t know who else to call. Particularly, volunteer responders must be acknowledged because they serve their community for a small stipend intended to

offset expenses, participate in training sessions which take up several hours a week, and leave their families to respond to emergency incidents.

The purpose of this discussion paper is to drive home the point that there is such a scarcity of data in most fire services that there is almost no choice but to continue the traditional approach to fire service delivery because there is no information upon which to base change.

Our recommendation is for municipalities to concentrate on an immediate strategy and plan to improve data and information so that whatever decision jurisdictions might make with respect to fire service response models can be taken based on fact, rather than an assumed understanding of the efficacy of fire service response.

b) Introduction to “tiered response”

Many Emergency Medical Services (EMS) systems dispatch a local fire truck in addition to a paramedic ambulance crew to a carefully selected subset of EMS 9-1-1 medical calls to speed the delivery of specific time-sensitive interventions such as cardiopulmonary resuscitation (CPR), bag-mask ventilation, automated external cardiac defibrillation, and the application of tourniquets to control peripheral bleeding.

Fortunately, less than 2% of EMS patients ever require these interventions, and most of such care is provided by ambulance paramedics. However, in the proportion of cases where the fire crew arrives before paramedics and delivers one of these interventions, the fire crew’s intercession may be lifesaving.

This practice – known in Ontario as “tiered response” – operates best when municipal policy makers establish a fine balance between its benefits, its costs and its risks, a process which turns out to be remarkably complex. To help navigate this issue, this paper provides municipalities with an evidence-based framework for deciding whether, when, where, and how municipal firefighters should respond to some select portion of 9-1-1 medical incidents.

Even where a community already has a “Tiered Response Agreement” in place, this paper provides a framework to guide the necessary periodic reviews of the terms, conditions, and operational details of these agreements. Tiered Response agreements should be routinely revisited and updated – preferably annually - in every community to reflect changes in medical practice, skill sets, and the local EMS and Fire Service operational environment. For instance, the long-standing assumption that almost every EMS patient might benefit from oxygen administration is understood to not only be incorrect, but actually harmful to many patients.

x. “When you’ve seen one response system, you’ve seen one response system.”

At the outset, we offer a single guiding principle for policy development – “One size does NOT fit all.” While it is tempting to see how one community delivers tiered response and then propose universal adoption of that local practice in other regions, such generalizations ignore highly local factors such as EMS and fire service call volumes, fire service configuration (full-time or on-call) and resources, local EMS response times, community risk tolerance, available municipal funding, and the nature of the coverage area (urban, suburban, rural or wilderness).

c) The Background and Context for tiered response

i. When can tiered response improve patient outcomes?

Outcomes for EMS patients may benefit from firefighter response when the following three conditions are met:

- The patient must need one of the several time-sensitive interventions available from firefighters
- The fire crew must arrive at the patient’s bedside a meaningful time ahead of the EMS paramedics.
- The fire crew must recognize the need for the intervention and deliver it before EMS paramedics arrive.

Fire crews are authentically helpful to EMS paramedics in some other incidents by helping lift heavy patients, assisting family members, marshaling equipment on-scene, etc. However, these services are almost never critically time-sensitive and, of themselves, do not warrant the risks of a lights-and-siren response by a fire crew. A non-emergency response by firefighters, arriving a few minutes later, is more than sufficient.

Firefighter response for fire suppression, crash rescue extrication, management of on-scene hazards such as downed power lines, containment of hazardous materials, etc. – even when part of an EMS call -- are not part of tiered response and therefore are not part of this discussion.

ii. “Every EMS call is a life hanging in the balance” and other misunderstandings

While many people make the cultural assumption that “a life hangs in the balance” in every 9-1-1 medical incident, the truth is that very few EMS medical calls involve a critical illness or injury where immediate intervention by anyone – EMS paramedics or local firefighters – is needed or will alter outcomes.

Considered as a group, EMS patients look a lot more like the spectrum of people seen in a hospital emergency department – the vast majority with minor medical problems posing little risk to their lives. Even among patients who arrive at hospital by EMS ambulance, most will quite

safely wait an extended period of time, often hours, before definitive treatment. Moreover, the vast majority will be discharged without even overnight admission to hospital.

Why This Matters: *Understanding this reality – that few EMS patients are critically ill – assists policy makers in developing a realistic, nuanced, and balanced tiered response policy which reduces risks to critical patients while not inadvertently increasing other risks and costs.*

iii. Do “Seconds Save Lives” in EMS Incidents?

Similarly, it is intuitively appealing to believe that very rapid arrival of some provider – EMS paramedics or local firefighters – perhaps within four or five minutes in every 9-1-1 medical call -- might markedly improve survival and reduce enduring disability for every EMS patient.

It turns out that the truth is more complicated.

On the one hand, truly critical patients – for instance, those who are not breathing – require intervention immediately, not in four to five minutes. For every minute which passes before intervention commences, more of these patients will die. There is no “response time standard” – for EMS or fire – which is fast enough. The EMS system simply has to get help to these patients as fast as possible.

Some other EMS patients benefit from prompt – but not critically urgent – paramedic response, and do not require the “first response” interventions available from firefighters. In fact, paramedics in most “best-practice” EMS systems use “lights-and-sirens” in about 15% of responses to incidents, and 2-3% of trips to hospital.

Most other patients require neither an emergency response to their bedside nor critically urgent transport to hospital.

Why This Matters: *For the most critical EMS patients – such as those in cardiac arrest – there is no “short-enough” response time. Survival depends on the fastest possible response. For most other EMS patients, response time does not alter outcomes.*

d) The Challenge: Getting the right care to the right patient in the right time frame

Getting the fastest possible help to a small percentage of EMS patients, while not over-responding to the rest, is a central challenge in the design of tiered response systems.

The annual volume of 9-1-1 EMS incidents is significant in most communities, often as high as 70-100 incidents per year for every 1,000 residents in a community. Actual local volumes are affected by the percent of the population over age 55 years, local socio-economic status, access to primary care physician services, and daily and seasonal variations in population. Typically, two-thirds of EMS emergency calls will occur in daylight when work, school and other activity is at its peak.

In most EMS systems, between 25% and 30% of EMS incidents ultimately do not result in transport to hospital for any number of reasons, including a patient's decision to seek alternative medical care, the on-scene resolution of the medical issue, or an incident which proves not to involve actual injury. About 1% of incidents involve a sudden death in the community where circumstances do not warrant resuscitation. In Ontario, the transport and disposition of deceased persons is managed by the Regional Coroner's office, and normally does not involve EMS.

i. "So why not send everyone - EMS, fire, and police - to every call, just to be safe?"

Given the urgency of reaching the most critical of patients, there is a temptation to feel that providing the most urgent possible response to every 9-1-1 EMS incident by all available responders – EMS, fire, and police – would reduce risk in the community by ensuring that every incident gets the same response.

Intuitively, such a "Shotgun Response" policy might appear to "reduce risk"; in fact, the policy increases risk and cost with little benefit.

Here's how:

1 – Increased Risk to Providers - Needless "lights-and-siren" responses place firefighters and paramedics at risk of traffic collisions which occur en route to incidents.

2 – Increased Risk to Members of the Public – People in private cars which collide with heavy fire trucks and large ambulances bear the brunt of injury and death in "emergency response" collisions. Similarly, where loss of control of an emergency vehicle occurs, pedestrians and others can be seriously or fatally injured.

3 – Increased Risk to Municipal Assets – A needless response which results in writing off a fire truck with a replacement cost of \$375,000 to \$1 million is an avoidable risk.

But here's the most important risk:

4 – Risk to “The Next Patient” - No neighbourhood has “lots of fire trucks” or “lots of ambulances”. Sending fire crews to large numbers of minor EMS calls greatly increases the unfortunate risk that a neighbourhood’s fire crew will be already committed when a truly critical emergency occurs. This “next patient” must then wait for a more distant fire crew to respond often from considerable distance, exposing the critical patient to a potentially lethal delay.

So, in fact, a “Shotgun Response” policy *increases risk* to critical patients – who desperately need immediate intervention – if local fire resources are intentionally over-committed to minor EMS incidents.

5 – Risk to Integrity of fire Suppression Response – fire suppression and rescue resources are carefully stationed across each community to ensure complete and immediate response to fires, particularly where lives may be at risk. Few communities can afford “too many” fire crews, and most “Standard of Cover” plans assume the continuous availability of at least the first- and second-due fire crews to any incident. Needless over-response to minor EMS events erodes the fire suppression resources upon which the fire department’s coverage plans are based.

Why This Matters: *Over-response to EMS incidents – “sending everything to every call” – can endanger truly critical patients, other members of the community, fire, and EMS response personnel, as well as exposing municipalities to avoidable asset loss.*

ii. “Well, you never can tell if it’s serious until you actually get there...”

Actually, you can.

Incoming calls entering the EMS dispatch process are carefully screened and prioritized by Emergency Medical Dispatchers (EMDs) using a physician-supervised scripted caller interview process to establish the nature and severity of the incident, and to ensure that the right response is provided at the right level of urgency.

While this process is cautious and risk-adverse, most state-of-the-art EMS dispatch centres consider only about 15% of incoming calls to warrant immediate urgent response in order not to miss the 3-5% of patients who are critically ill or injured, and the 2% who might benefit from firefighter interventions. This deliberate but limited degree of “over-triage” -- strikes a careful balance between the benefits of urgent response to the right patients and the risks and costs of “shotgun response.”

Most important, in best practice EMS dispatch triage, the decisions about which incident types – known as “determinants” – warrant the most urgent response are now driven by dense

accumulated data from hundreds of thousands of actual patient encounters. This vast amount of clinical data allows accurate prediction of the likelihood that a patient in any specific EMS determinant will be seriously ill, and whether they are likely to need one of the time-sensitive interventions available from firefighters.

Fortunately, the accumulated experience of other EMS systems can be used to guide decision-making where there is limited or a complete absence of local data. While the total number of patients in each dispatch determinant – for instance, those with chest pain and a history of heart problems - will vary between communities, the clinical needs of patients in each determinant are largely universal and well-understood.

Why This Matters: *Modern best practices allow EMS dispatch centres to safely identify the relatively small subset of incoming EMS incidents to which firefighters ought to respond.*

iii. Incident Classification Versus Response Plan Designation

Each EMS call triage algorithm has two parts and two purposes:

- First, ensuring that all incidents described the same way will always be assigned to the same dispatch category (“determinant”), regardless of who the caller is, or the skill and experience of the EMS call-taker.
 - The use of a strictly scripted interview ensures standardization of call classification. This is the great strength of algorithm-based call entry.
- Second, ensuring that every incident in a particular determinant receives the same EMS response
 - This is achieved by assigning a specific “response plan” to every determinant which directs EMS dispatchers what resources – including firefighters when warranted – to send, and how urgently, compared to other incident types.

For example, Toronto Paramedic Services has 30 years of experience using the Medical Priority Dispatch System (MPDS) (Priority Dispatch Corporation, Salt Lake City, Utah), a protocol used in hundreds of EMS dispatch centres in 45 countries and 21 languages. Each incoming call is allocated to one of more than 1,400 highly descriptive possible incident determinants.

Every call in a particular determinant is assigned one of nearly a dozen possible pre-determined response plans, ranging from the most urgent - “Echo” response – to the least urgent, where instead of an immediate ambulance response a patient may be offered a secondary interview with a nurse to decide whether care other than paramedic response is appropriate.

In this way, not only is there a consistent response to every call in each type of incident, but just as important, where calls compete for resources in real time, accurate decisions about

reassigning an ambulance from one call to a more urgent one are facilitated by the carefully designed hierarchy of urgency.

iv. The Ontario EMS Dispatch Context

At this writing, in Ontario, only the Toronto, Niagara, and Ottawa EMS dispatch centres use the MPDS algorithm, with the remaining 19 Ministry of Health-operated Central Ambulance Communications Centres (CACCs) or contracted Ambulance Communication Centres still using the MOH's own internally-developed call-screening protocol known as Dispatch Priority Card Index (DPCI). The MOH has committed to gradually phasing out DPCI and implementing MPDS across the province, but this will take some years.

Unfortunately, it has been the historical practice of centres using DPCI to assign as many as 90% of incoming incidents the same maximal urgency, a classification known as "Code 4", despite evident differences in the likely urgency of the incident. We acknowledge that the frequency of code 4 responses has declined in the past few years as a result of medical review of the DPCI but the incidence of code 4 calls is generally over 70%.

This practice has all the disadvantages of the "Shotgun Response" discussed above, most particularly in smaller communities with a single locally available ambulance. Even in an environment where multiple ambulances are available, the failure to properly distinguish among relative urgency is likely to result in delayed response to truly urgent incidents by over-serving clearly more minor patients.

DPCI has the further disadvantage of having fewer incident categories than MPDS which blunts the ability to carefully tailor responses to the needs of specific patients even when extensive clinical data may be available.

This issue has high relevance to Tiered Response policy. In locations using MPDS, a more carefully tailored set of determinants may be designated for firefighter response. In EMS CACCs using DPCI, it may be less clear which of DPCI's broader and more imprecise categories offer the optimal opportunity for firefighter intervention.

v. In your community, who arrives first, EMS or fire?

Multi-agency responses are not horse races, nor are they a competition. However, for tiered response to bring clinical benefit to critically ill or injured patients, a community's fire service must demonstrate the ability to arrive significantly before EMS paramedics in a meaningful proportion of cases, and actually deliver certain critical interventions such as automated cardiac defibrillation before EMS arrival.

In many urban areas, this practice has been shown to be clinically successful, and operates fully recognizing that in some cases, fire will arrive first; in other cases, EMS will arrive first.

However, few topics in tiered response have been subject to so much conjecture and passionate assertions than the issue of “Who arrives on scene first?” – fire or EMS – and by how much. Research shows that the distribution of “first arrival” between EMS and fire is community-specific for a variety of reasons, and that one community’s EMS-vs-fire arrival times cannot be inferred from another community’s data.

vi. What Does the Data Show?

A recent analysis of more than 116,500 joint responses at six fire departments serving 4.8 million people (36% of Ontario’s population) in the Greater Toronto Area (GTA) demonstrated wide municipality-specific differences in the proportion of incidents where firefighters arrived before EMS paramedics, and by how much time.

The data, supplied by the fire services themselves and regional EMS agencies, showed that on average across the six municipalities, fire crews arrived two minutes or more ahead of EMS paramedics in 38.6% of incidents, with a community-specific range from 11.5% to 55% of incidents.

The two-minute threshold has been widely accepted clinically as a reasonable measure of a response time difference likely to empower fire crews to perform a critical intervention before EMS paramedics arrive, particularly in high-rise buildings where access to patients is often slow compared to walking in the front door of a suburban bungalow.

This threshold also recognizes that overly tight “horse-race” comparative numbers, such as “EMS arrived fifteen seconds before fire” (or vice-versa), have no clinical or operational significance.

Overall, EMS paramedics arrived within five minutes of fire crews in 85.7% of cases, with local rates ranging from 79% to 97%.

Why This Matters: *There is no such thing as “always” ... Sometimes fire arrives before EMS and sometimes, EMS arrives before fire. The proportion of cases where fire arrives a significant time ahead of EMS supports tiered response to critical patients, but not response to patients with minor medical problems.*

vii. Avoiding a Classic Error

The single most common error in assessing inter-agency arrival time is the classic mistake of comparing each agency’s official overall annual “response time” statistics and from those two numbers attempting to draw inference about which agency will “always” arrive first, and by how much.

Here's an example how of this error is made:

- An EMS system reports its 2018 response time is "nine minutes at the 90th percentile."
- The local fire service reports its 2018 response time to be "an average of four minutes."
- **The Error:** Subtracting one number from the other and concluding that "fire always arrives five minutes ahead of EMS"

For a range of reasons, this "calculation" is mathematically meaningless and **does not** offer **any** insight into how often EMS will arrive first and how often fire will arrive first.

viii. Quantifying EMS versus fire arrival – A Data-Driven Approach

Determining how often each agency arrives first, and by how many minutes/seconds, can only be established by direct call-by-call matching of EMS and fire Computer-Aided Dispatch (CAD) data showing, for each incident, the actual time EMS arrived at each incident and the actual time fire arrived.

For example, if, in one incident, fire arrived at 03:40:30 hrs. and EMS arrived at 03:41:00 hrs., then for this call (only), fire arrived 30 seconds ahead of EMS.

With a large enough data sample – optimally several thousand incidents - a reliable understanding of the distribution of how often each agency arrives first, and by how many minutes/seconds can be derived. Small samples, or sentinel cases which attracted public scrutiny, are of very limited value in making public policy.

What happens if there is no data?

If for some reason, call-by-call data is not available from both the EMS and fire dispatch centres for their joint responses, then no conclusions can be drawn. Without data, it is reasonable to assume that "sometimes fire will arrive first, and sometimes EMS will arrive first", and no more.

In these circumstances, policy makers may encounter stakeholders with strong opinions about what the data would show, were it to be available. However, as in all areas of medicine, passionate views are a poor guide to good decisions. If your community lacks data, organize its collection.

Since it is well-established that the relative arrival times for fire and EMS are highly specific to each community, the experience in one community cannot be used to predict what will occur in another.

Why This Matters: *Without both EMS and fire arrival time data specific to your community, the best one can conclude is that sometimes EMS will arrive first, and sometimes fire will arrive first.*

Where there is no data, it should be collected prospectively. However, in the absence of data, caution should be exercised where passionately held stakeholder views argue that data is not needed.

What about areas served by volunteer/part-time fire departments?

The value of tiered response for selected patients in urban areas is well-established. However, in communities served by a 24-hour in-town EMS paramedic ambulance, but by an exclusively volunteer or part-time fire department, only carefully collected data will assist in determining whether the basic precept of tiered response – meaningfully-frequent fire first arrival – is fulfilled. If not, it is no criticism of the fire department involved, just an operational reality in circumstances where firefighters must be paged to respond to their station, assemble a full crew, and only then commence their response.

Conversely, the ability to routinely place a fire crew at an EMS call before ambulance arrival is not, of itself, the criteria for expanding the proportion of calls to which firefighters respond. The clinical value of tiered response is specific to a small subset of critically ill or injured patients, and fast fire response is indeed valuable to those patients; however, that ability to arrive first should not cause “mission creep” to incidents where no clinical value would arise from duplicate response.

What EMS incident types warrant “tiered response”?

In deciding how to tailor tiered response for optimal utility, it’s worth reviewing the criteria for its clinical benefit to patients:

1. Response to the subset of EMS incidents which are likely to produce a patient needing one of the time-sensitive interventions available from firefighters:
 - Primary cardiac arrest is an emergency where firefighter interventions (CPR and automated defibrillation) are proven to improve patient outcomes. Better yet, CPR and publicly available automated defibrillation is even more desirable than rapid emergency service response.
 - Cardiac arrest from trauma is not. All trauma patients who need on-scene CPR die of their injuries. In multiple patient situations, these patients will normally receive no treatment at all.
 - Certain truly critical patients – such as a person shot in the chest – are not amenable to firefighter or even EMS paramedic intervention. You can’t “stop the bleeding” – the patient is bleeding to death internally, and the patient needs only a single urgent intervention – immediate transport to a trauma centre.
2. Local circumstances where firefighters are likely to arrive a meaningful time interval ahead of EMS paramedics on a reasonable proportion of responses:
 - Although it is a matter of local preference, the likelihood of arriving two minutes ahead of EMS paramedics in 25% of responses suggests worthwhile opportunity to benefit the community.

3. Training and experience for fire crews which make it likely they will recognize the need for one of the critical interventions for which they are trained, and, that they are likely to perform that intervention:
 - The need for CPR is self-evident.
 - But knowing when to start assisting a spontaneously breathing patient with their ventilation using a bag-valve-mask requires considerable experience.

ix. Applying the Concept of Medical Futility

In general, a medical intervention which has less than one chance in 100 of succeeding is considered “futile” and not worth undertaking. In tiered response, EMS and fire medical directors have successfully applied an adaptation of this principal to selecting EMS call types to which firefighters should respond.

For example, let’s consider a particular EMS dispatch incident type which has 1 chance in 25 of producing a patient needing time-sensitive firefighter intervention, in a community where data shows firefighters arrived more than two minutes ahead of EMS in 50% of incidents. Is tiered response warranted for this specific incident type? Yes, because:

- For every 100 responses to this call type, four incidents will require intervention
- For every 100 fire responses, a fire crew will arrive before EMS in 50 cases, and 50 after EMS.
- This means that among the 50 cases where fire arrived first, two patients will need fire intervention (4 out of 100, 2 in 50)

So tiered response is warranted for this specific EMS incident because 2 in 100 firefighter responses, 2% of runs, will provide an opportunity for firefighter intervention, meeting the test of futility.

It is also worth noting that this means that in 98 out of 100 firefighter responses to this call type, firefighters will **NOT** have the opportunity to deliver a time-sensitive intervention.

Why this matters: *Where good EMS data is available, tiered response can be tailored to incident types most likely to produce the opportunity for critical time sensitive intervention by firefighters. Response to incidents very unlikely to require such interventions has little prospect of improving outcomes for 9-1-1 patients.*

x. The Basis for Decision Making

There are many dynamics and factors that go into decisions including empirical, gut, past and current practice, and data. The best of these is data. Unfortunately, fire service response, cause, and outcome data within many fire services is sparse which means decisions must be made based on components such as empirical, gut, past and current practice, and others. While fire

almost all fire services can provide some response data, the causative and outcome aspects are usually incomplete, which means that it is not possible to more objectively determine the degree to which fire service responses assist and provide value to the public

Even the Standardized Incident Reports completed for the Ontario Fire Marshal's office are insufficient to determine benefit to the public and then relate that to cost. **Benefit relative to cost** is a definition of **value** and while no one should suggest that fire services don't have value, clearly defining its extent for the public and decision makers, in other than subjective terms, is difficult without facts – and most fire services do not gather adequate statistics. Additionally, with respect to tiered response, fire and paramedic services data must be coordinated to the point of the type of information gathered and time synchronization.

e) Role of a Medical Director in System Design

Every EMS system in Canada operates under the direction and close supervision of a physician who is normally Board-certified in emergency medicine and increasingly, also holds Board-certification in Emergency Medical Services (EMS). This supervision includes development and approval of local medical directives in concert with provincial standards and national and international best practices. In Ontario, each EMS medical director is affiliated with the area's Base Hospital Program, which provides coordination across multiple adjacent jurisdictions including quality assurance and continuing medical education.

Some fire services have the resources to retain a part-time Medical Director for their tiered response and internal first aid/medical training, and where a fire Medical Director exists, that person is expected to work closely and cooperatively with the EMS Medical Director.

In either case, the design of the local tiered response policy should actively involve or be led by the local EMS and/or fire Medical Director(s). This ensures that decisions and policies pass through the lens of best practices and patient safety. Just as the region's EMS Chief defers to the Medical Director on issues of the practice of medicine, so also it is wise – essential actually – that fire chiefs do so too.

Aside from bringing complex knowledge in emergency medicine to the discussions, deferral to the judgement of the Medical Director provides high-grade insulation against criticism of the fire service, elected officials, and public service staff for operational decisions – such as what incidents should receive tiered response. Inevitably, occasions arise when errors, unexpected circumstances, or true anomalies occur. If the tiered response process is operating in compliance with the Medical Director's approved practices, those with concerns about the system can be referred to the Medical Director whose qualifications and judgement are harder to assail.

Why this matters: *Tiered response is an extension of the provincially regulated pre-hospital practice of medicine and should be guided by a physician trained and experienced in emergency medicine and the design of EMS systems.*

i. Data-Driven Policy Making in Tiered Response

When tiered response systems were first implemented, response by firefighters was based on leadership speculation about which EMS incident types might produce opportunities for critical intervention by firefighters. In some cases, 9-1-1 operators were actually allowed to decide on their own to send a multi-agency response if they personally felt “the call sounded serious”, and not if they didn’t.

Today, precise clinical data has now replaced speculation in the process of determining which EMS incident types warrant firefighter response.

All EMS services in Ontario have electronic patient care record systems which provide a rich record of each patient’s condition and the interventions they required at the scene and en route to hospital. It is in the interests of every fire service and municipal decision makers in their community that fire service documentation for every response they perform move to the same level of detail as found in EMS record keeping. Where this kind of fire service data is in place, a much more precise and predictive dialogue about the detail of tiered response can occur, based on actual proven experience and patient need and not on organizational culture, preference, or speculation.

There is an axiom in medical patient care record keeping which is “Not charted, not done.” A much richer and more practical discussion about the design of local tiered response can occur with real data rather than authentically held beliefs that “we do a lot of...(whatever)…”

At this point, provincially mandated fire service reporting contains insufficient detail to guide these discussions. Fire Chiefs will greatly strengthen the quality of the discussion about tiered response by implementing, in partnership with EMS, local tiered response record systems which record the nature and apparent severity of each patient they encounter, and all interventions provided by firefighters prior to arrival of EMS paramedics.

ii. What happens if there is no local data?

Fortunately, data which guides the selection of EMS incident types which provide the most opportunities for critical interventions by firefighters is widely available and is not location specific. The results from any large dataset can be used, such as that published in January 2010 issue of *Prehospital Emergency Care*, the scientific journal of the National Association of EMS Physicians. In addition, excellent work in this regard has been done by British Columbia Emergency Health Services, by Toronto Paramedic Services, and others.

Most Ontario communities are covered by multi-agency “tiered response” agreements which guide the local EMS dispatch centre in the dispatch of firefighters to selected EMS incidents. It is essential to remember that the opportunities fire will have to intervene are also dependent on the proportion of incidents where they arrive first.

This can have a major impact on system design, so collecting local “First Arrival” data becomes very important. For instance, in a community where fire arrives first twice as often as in an adjacent community will have twice as many opportunities to intervene.

iii. Prohibition on Patient Abandonment

In designing tiered response, it is important to remember that once a fire crew makes contact with a patient requiring care, this patient cannot be “abandoned” by the fire crew before EMS arrival, even where it is the fire crew’s opinion that the patient’s complaint is minor. In addition, where the assistance of the fire crew is reasonably necessary after EMS arrival – such as providing CPR compressions during cardiac arrest resuscitation – the fire crew will remain unavailable until their assistance is no longer required.

This means that the design of tiered response policies cannot include provision for extracting a fire crew from the scene of a medical call before paramedic arrival in order to respond to some compelling incident such as a structure fire.

Where patients are abandoned, disastrous and often entirely unpredictable consequences can follow. Once care is available on scene from a fire crew, that care cannot be properly withdrawn until care of the patient can be transferred to EMS paramedics. Firefighters are neither trained nor reasonably expected to anticipate all the ways a patient could deteriorate.

Why this matters: *Once a fire crew is committed to an EMS incident, it cannot be re-assigned to another emergency such as a structure fire until EMS paramedics arrive **and** joint patient care is completed.*

iv. An Architecture of Options in Tiered Response Design

To this point, this paper has focused on traditional tiered response, that is, lights-and-siren response by a full crew of firefighters operating a standard fire truck, responding in addition to EMS paramedics in their transport-capable ambulance. However, there are alternatives which are designed to mitigate some of the risks inherent to the classic model, and which can provide operational and clinical flexibility to tiered response policies. These involve variations in what fire sends to an EMS call, how that crew responds, and what they offer to patients.

f) Restricting Lights-and-Siren Response

Emergency response to 9-1-1 incidents – that is, the use of “red-lights-and-siren” -- remains a principal factor in emergency vehicle accidents and the risk of injury and death to both emergency providers and the public at large. The underlying theory behind “emergency response” to EMS patients is that reducing the time for rescuers to arrive at a specific incident produces provable improvements in outcomes. In fact, this is rarely true.

In contemporary “best-practices” EMS systems, only about 15% of ambulance responses involve use of red lights and sirens.

Where a fire service wishes to offer a broader range of services to EMS incidents than time-sensitive interventions, adopting the current practices of their EMS colleagues – response without lights-and-sirens – to other than the most urgent calls is a wise and safe strategy.

For instance, “lift assist” calls, either as assistance to an EMS crew already on an incident scene, or a request from a family to put a family member back to bed, do not warrant a “lights-and-siren” response unless explicitly requested by paramedics already with the patient.

Similarly, where it is decided to offer response to “first aid” calls for minor injuries, such responses should be “cold” – that is, made without emergency warning systems and following the normal flow of traffic. None of these patients will suffer harm from the practice.

g) Specialized Small Vehicles for Tiered Responses

One of the greatest risks of tiered response is that it multiplies the number of lights-and-siren responses by traditional fire trucks, ranging from conventional triple combination pumpers to large elevating platform trucks worth more than a million dollars.

Response accidents involving vehicles of this size pose an unusually deadly risk to the occupants of any civilian vehicle with which they collide, or others, such as pedestrians, where a loss of control occurs. To expose the public to this risk, to risk the value of such municipal assets, and to risk death or disability for the firefighters themselves, a tiered response should have clear and predictable benefit, not just “a chance” of making a difference.

- **Alternative:** Risks are greatly reduced by responding to tiered response incidents with only two firefighters operating an “SUV”-type vehicle or modified light truck. For the purpose of this paper, we will refer to these as “EMR Response Units”

The two firefighters operating the EMR Response Unit can join their parent pumper or aerial crew at the scene of a fire or other emergency which arises while they are returning from an EMS incident.

i. Dedicated vehicle and staffing for tiered response

One strategy for low-cost mitigation of the operational impacts of tiered response on an “all-hazards” fire service is to dedicate two staff members 24/7 to an EMR Response Vehicle which responds exclusively to tiered response EMS incidents.

If, in addition to being dedicated to tiered response, this vehicle remains mobile – and therefore able to respond instantly with no in-station delays -- at least through the busiest parts of the day, a single EMR Response Vehicle can cover the first-due districts of two and sometimes three fire stations. There may be areas where a traditional crew will need to respond instead, such as in remote areas of the jurisdiction, but for the busiest areas of some communities, this strategy is a cost-effective and clinically appropriate alternative, quite capable of placing fire resources at EMS incidents at least as fast as classic response models.

Mobile deployment strategies such as proposed here are a normal “best practice” in EMS, reducing response times where resources are stretched.

We acknowledge that this option is more suited to a high incident, densely populated environment.

ii. Expanded Scope of Practice

Some Fire Services have hired new firefighters who also have EMS experience, some of whom may even possess ongoing certification as paramedics if they continue to work part time for an Ontario EMS service. This has raised the question of whether these individuals could provide patient care at a higher level than their fellow firefighters when on duty as firefighters, given their prior training and experience.

In general, the answer is “no”. Ontario law narrowly defines the title “paramedic” and constrains their practice solely to their employment in a licensed ambulance service. This permission to practice is not portable to other employment or other operational environments, no matter how willing the other employer might be. Further, the College of Physicians and Surgeons of Ontario’s Policy Statement on Delegation of Controlled Acts prevents physicians from setting up paramedic operations independent of those permitted by the Ambulance Act.

All the same, firefighters with EMS experience are a true asset in Tiered Response incidents as they possess valuable patient assessment, interpretive and management skills. These skills allow them to streamline care for the patient once EMS paramedics arrive by careful assessment of the patient and by providing a concise and credible verbal report to paramedics about the incident, the patient’s condition, and their past medical history. Their skills also reduce the risk of innocent but disastrous error by firefighters in high risk circumstances such as when a patient tells firefighters that they don’t want to go to hospital and where firefighters are considering cancelling the responding ambulance.

h) Key Points for Municipal Policy Makers

24. Tiered response, the practice of sending local firefighters to a select subset of EMS 9-1-1 medical incidents can improve survival for critically ill or injured patients requiring specific time-sensitive interventions available from municipal fire crews.
25. Fewer than 2% of EMS incidents involve critical patients who might benefit from the intervention of a fire crew.
26. Fire response should be tightly tailored to reach critical patients where fire can arrive enough before EMS paramedics to intervene. In best-practices communities, fire responds to about 15% of EMS incidents in order to reach the 2% of patients who might benefit from firefighter interventions.
27. Sending firefighters to every EMS incident regardless of severity increases risk to the community without a corresponding benefit to critically ill or injured patients.
28. The potential value of tiered response in a community can only be measured with high-quality contemporary EMS and fire dispatch data. In the absence of data, one can only conclude that "sometimes EMS will arrive ahead of fire, and sometimes fire will arrive ahead of EMS and occasionally the patient might benefit."
29. The proportion of times where fire will arrive before EMS varies between communities. The experience of one community cannot be used to predict the experience in another.
30. Demonstrating the value of tiered response depends upon the fire service transitioning to a process of recording details about their responses to EMS incidents, including the nature of the emergency, the apparent severity of patient's illness or injury, and a complete record of interventions and care that the fire crew completed prior to the arrival of EMS paramedics.

i) Medical Priority Dispatch System (MPDS) Determinants Likely to Warrant Tiered Response

In this table, we present a list of MPDS categories - "determinants" – which one major Canadian city showed would produce more than one opportunity for firefighter intervention per 100 responses, based on firefighters arriving before EMS paramedics in 50% of responses.

Implementation of this list mandated fire service response to 15% of all EMS incidents in the city and was approved by the Medical Directors for both fire and EMS.

While minor variations from this list may be warranted by local circumstances, the list provides useful guidance in the type of EMS incidents which produce opportunities for critical intervention by firefighters.

MPDS Determinant	MPDS Determinant Description
06E01	BREATHING PROBLEMS INEFFECTIVE BREATHING
09E01	CARDIAC / RESPIRATORY ARREST / DEATH Not breathing at all
11E01	CHOKING COMPLETE obstruction/INEFFECTIVE BREATHING
31E01	UNCONSCIOUS / FAINTING INEFFECTIVE BREATHING
09E02	CARDIAC / RESPIRATORY ARREST / DEATH Breathing uncertain (AGONAL)
09E03	CARDIAC / RESPIRATORY ARREST / DEATH Hanging
02C01	ALLERGIES ENVENOMATIONS Difficulty breathing or swallowing
02C01I	ALLERGIES ENVENOMATIONS Difficulty breathing or swallowing; Injection administered or advised
31. 02C02	32. ALLERGIES ENVENOMATIONS History of severe allergic reaction
02C02I	ALLERGIES ENVENOMATIONS History of severe allergic reaction Injection administered or advised
02D01	ALLERGIES ENVENOMATIONS Not alert
02D01I	ALLERGIES ENVENOMATIONS Not alert Injection administered or advised
02D02	ALLERGIES ENVENOMATIONS DIFFICULTY SPEAKING BETWEEN BREATHS
02D02I	ALLERGIES ENVENOMATIONS DIFFICULTY SPEAKING BETWEEN BREATHS Injection administered or advised
04D01A	ASSAULT / SEXUAL ASSAULT Unconscious or Arrest Assault
06D01	BREATHING PROBLEMS Not alert
06D01A	BREATHING PROBLEMS Not alert Asthma
06D02	BREATHING PROBLEMS DIFFICULTY SPEAKING BETWEEN BREATHS
06D02A	BREATHING PROBLEMS DIFFICULTY SPEAKING BETWEEN BREATHS Asthma
06D03	BREATHING PROBLEMS CHANGING COLOR
06E01A	BREATHING PROBLEMS INEFFECTIVE BREATHING Asthma
07C03	BURNS /EXPLOSIONS Burns => 18% body area
09B01a	CARDIAC / RESPIRATORY ARREST / DEATH OBVIOUS DEATH unquestionable (a through i) Cold and stiff in a warm environment
09D01	CARDIAC / RESPIRATORY ARREST / DEATH INEFFECTIVE BREATHING
09D02	CARDIAC / RESPIRATORY ARREST / DEATH OBVIOUS or EXPECTED DEATH questionable
11D01	CHOKING Abnormal breathing (PARTIAL obstruction)
12D02	CONVULSIONS / SEIZURES CONTINUOUS or MULTIPLE seizures
12D02E	CONVULSIONS / SEIZURES CONTINUOUS or MULTIPLE seizures Epileptic or previous history of seizures
12D03	CONVULSIONS / SEIZURES AGONAL/INEFFECTIVE BREATHING
12D03E	CONVULSIONS / SEIZURES AGONAL/INEFFECTIVE BREATHING Epileptic or previous history of seizures
14D02	DROWNING / DIVING / SCUBA ACCIDENT Not alert
17D01	FALLS EXTREME FALL (=> 30ft/10m)
17D02	FALLS Unconscious or Arrest
19C01	HEART PROBLEMS / A.I.C.D. Firing of A.I.C.D.
19D01	HEART PROBLEMS / A.I.C.D. Not alert

MPDS Determinant	MPDS Determinant Description
23D01A	OVERDOSE / POISONING Unconscious Accidental
23D01I	OVERDOSE / POISONING Unconscious Intentional
24C01	PREGNANCY / CHILDBIRTH / MISCARRIAGE 2nd TRIMESTER hemorrhage or MISCARRIAGE
24D02	PREGNANCY / CHILDBIRTH / MISCARRIAGE Head visible/out
24D03	PREGNANCY / CHILDBIRTH / MISCARRIAGE IMMINENT delivery (=> 5 months/20 weeks)
24D05	PREGNANCY / CHILDBIRTH / MISCARRIAGE HIGH RISK complications
27D02S	STABBING / GUNSHOT / PENETRATING Not alert Stab
27D03G	STABBING / GUNSHOT / PENETRATING CENTRAL wounds Gunshot
27D03S	STABBING / GUNSHOT / PENETRATING CENTRAL wounds Stab
28C01C	STROKE Not alert Partial evidence (less than 2 hrs.)
28C01G	STROKE Not alert Greater than 2 hrs. since symptoms started
28C01L	STROKE Not alert Less than 2 hrs. since symptoms started
28C01U	STROKE Not alert Unknown when symptoms started
28C02J	STROKE Abnormal breathing Clear evidence (less than 2 hrs.)
28C03L	STROKE Sudden speech problems Less than 2 hrs. since symptoms started
29D01b	TRAFFIC / TRANSPORTATION ACCIDENTS MAJOR INCIDENT (a through f) Bus
29D04	TRAFFIC / TRANSPORTATION ACCIDENTS Pinned (trapped) victim
29D04M	TRAFFIC / TRANSPORTATION ACCIDENTS Pinned (trapped) victim Auto - pedestrian or Multiple patients /*
29D04U	TRAFFIC / TRANSPORTATION ACCIDENTS Pinned (trapped) victim Unknown number of patients
29D05	TRAFFIC / TRANSPORTATION ACCIDENTS Not alert
29D05U	TRAFFIC / TRANSPORTATION ACCIDENTS Not alert Unknown number of patients
30D01	TRAUMATIC INJURIES Unconscious or Arrest
31D01	UNCONSCIOUS / FAINTING Unconscious -- AGONAL/INEFFECTIVE BREATHING
31D02	UNCONSCIOUS / FAINTING Unconscious -- Effective breathing
31D03	UNCONSCIOUS / FAINTING Not alert
31D04	UNCONSCIOUS / FAINTING CHANGING COLOR
32D01	UNKNOWN PROBLEM LIFE STATUS QUESTIONABLE
33C01T	INTERFACILITY Not alert (acute change) Transfer/Interfacility
33D01T	INTERFACILITY Suspected cardiac or respiratory arrest Transfer/Interfacility

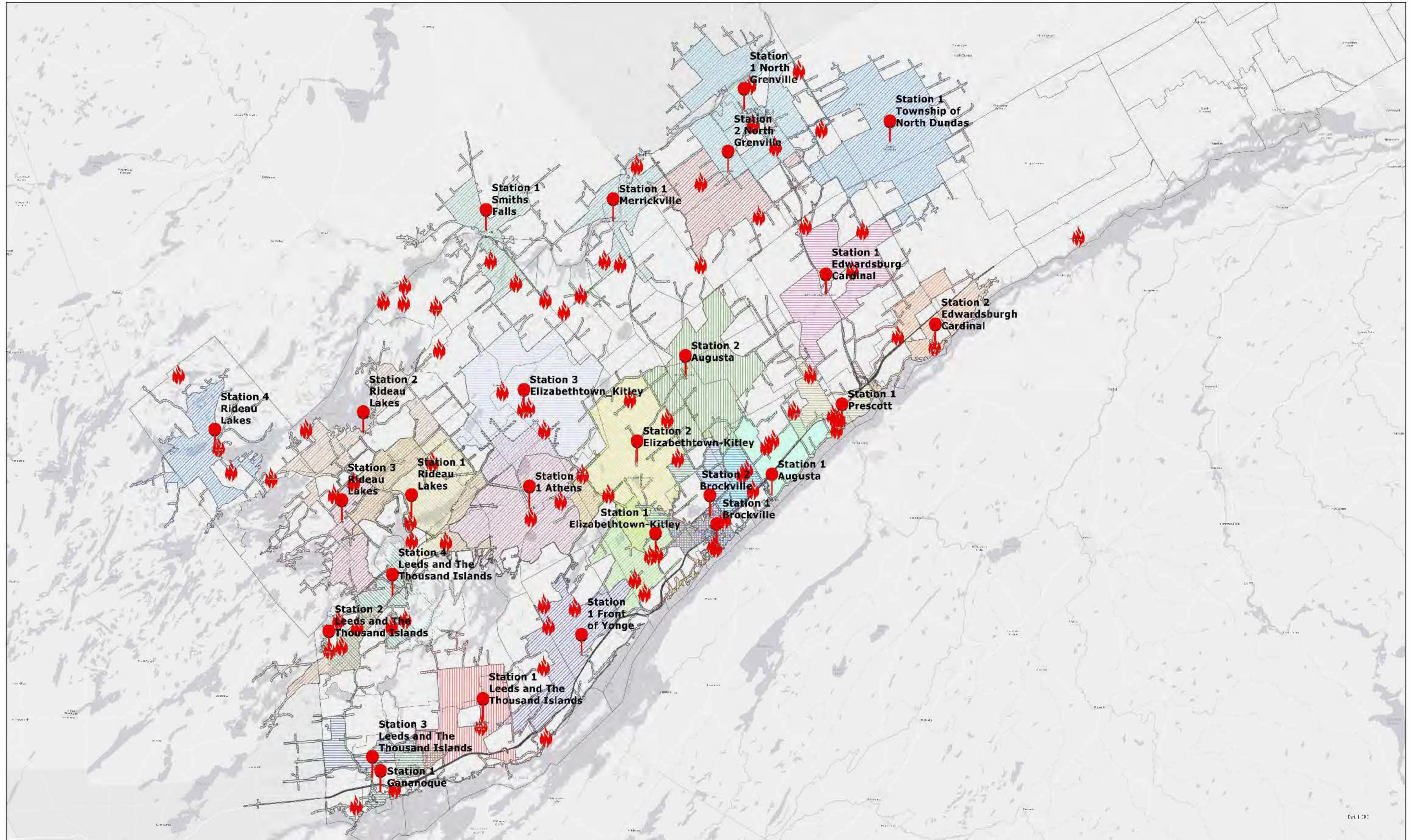
j) Reference Material

1. Advanced Clinical Interventions Performed by Emergency Medical Responder Firefighters prior to Ambulance Arrival; Lori L. Boland MPH, Paul A. Satterlee MD, Karl M. Fernstrom MPH, Kai G. Hanson MS, Prasanna Desikan PhD & Brian K. LaCroix EMT-P.
2. Ambulance Lights and Sirens Should Only Be Used When the Benefit Outweighs the Risks by Anna Bona, MD; and Matt Friedman, MD.
3. A practice review of the infrastructure and development processes of the 2013 British Columbia Emergency Health Services Resource Allocation Plan; Alan Craig, MScPI, ACP
4. College of Physicians and Surgeons of Ontario Policy Statement #5-12, Delegation of Controlled Acts.
5. Evidence-Based Optimization of Urban Firefighter First Response to Emergency Medical Services 9-1-1 Incidents; Alan M. Craig MScPI, P. Richard Verbeek MD & Brian Schwartz MD.
6. Evolving Issues in Oxygen Therapy in Acute Care Medicine; Laveena Munshi, MD, MSc; Niall D. Ferguson, MD, MSc.
7. Lights and Siren Transport and the Need for Hospital Intervention in Trauma Patients; David W. Ross DO, Lisa M. Caputo MA, Kristin M. Salottolo MPH, Raymond Coniglio RN, MSN, T. Ryan Mayfield MS, NREMT-P, Charles W. Mains MD, Matthew M. Carrick MD & David Bar-Or MD
8. Lights and Siren Use by Emergency Medical Services (EMS): Above All Do No Harm; U. S. Department of Transportation National Highway Traffic Safety Administration Office of Emergency Medical Services (EMS); Douglas F. Kupas, MD, EMT-P, FAEMS, FACEP.
9. Considerations in Establishing Emergency Medical Services Response Time Goals; Prehospital Emergency Care; E. David Bailey & Thomas Sweeney.
10. Use of Warning Lights and Siren in Emergency Medical Vehicle Response and Patient Transport; National Association of Emergency Medical Services Physicians (NAEMSP) and the National Association of State EMS Directors (NASEMSD).
11. Oklahoma's Data-Driven Approach to Urban EMS Response Time Reform; Journal of Emergency Medical Services; By Jeffrey M. Goodloe, MD, NREMT-P, FACEP , Curtis L. Knoles, MD, FAAP , Duffy McAnallen, NREMT-P , Matthew L. Cox, NRP , David S. Howerton, NREMT-P.
12. Operational and Administrative Analysis Tulsa Fire Department Tulsa, Oklahoma Draft Report – June 2016; Center for Public Safety Management; International City/County Management Association.
13. Unnecessary Use of Red Lights and Sirens in Pediatric Transport; Prehospital Emergency Care; Beech Burns MD, MCR, Matthew L. Hansen MD, MCR, Stacy Valenzuela MD, Caitlin Summers MPH, Joshua Van Otterloo MPH, Barbara Skarica MPH, Craig Warden MD, MPH & Jeanne-Marie Guise MD, MPH

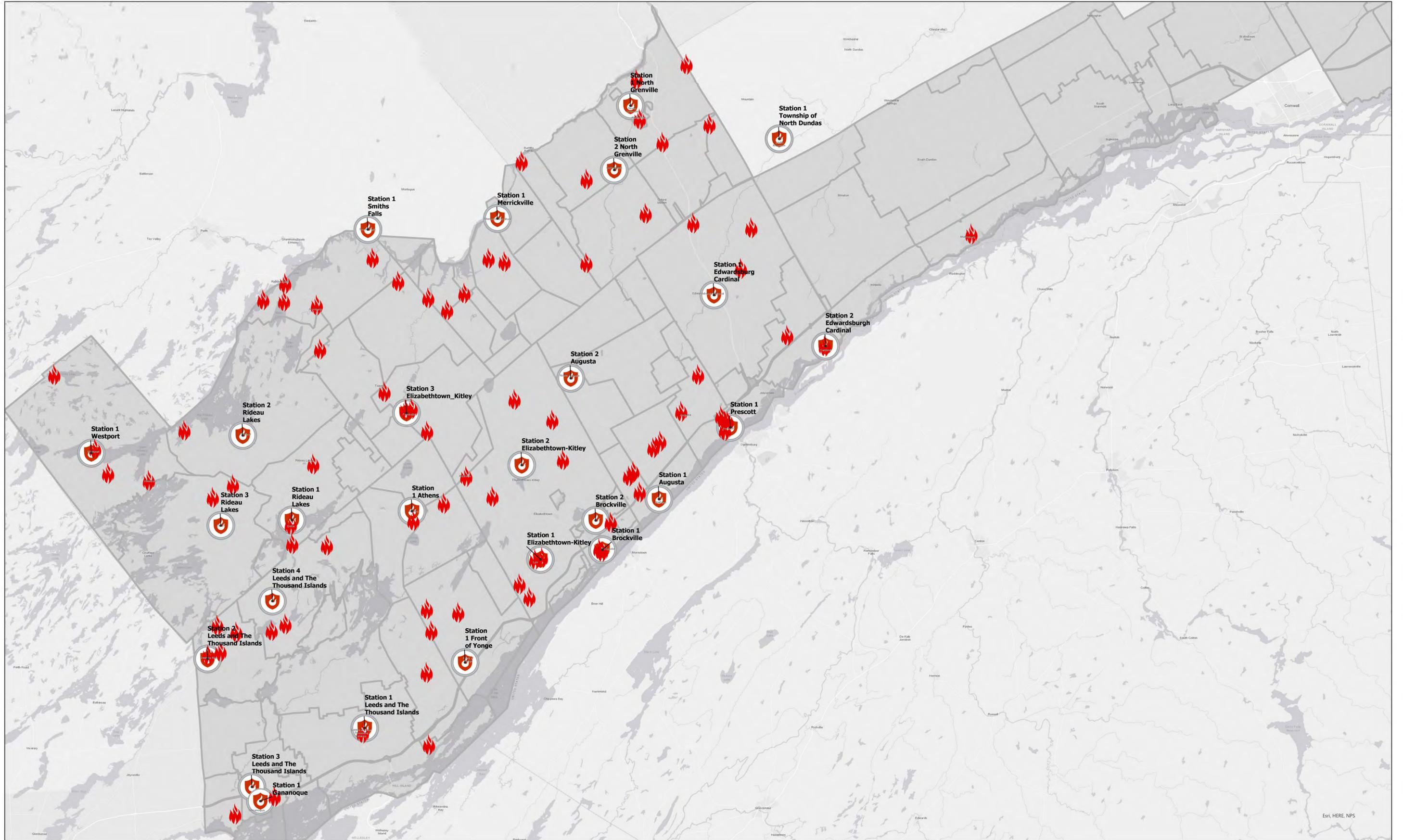
8. Appendix C: Response and Coverage Maps

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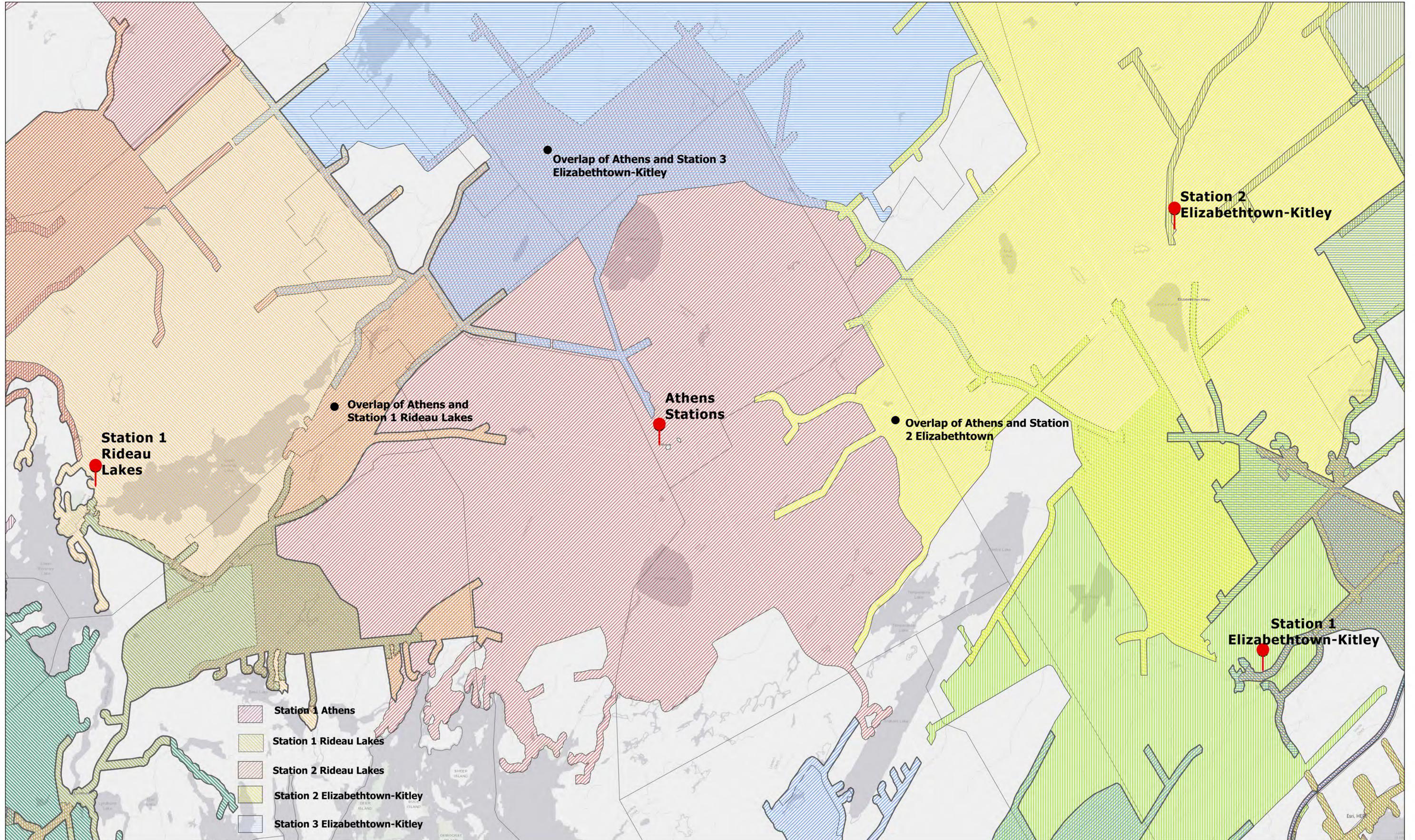
10-Minute Travel Time & Structure Fires 2019 United Counties of Leeds and Grenville



2019 Structure Fires Leads and The Thousand Islands



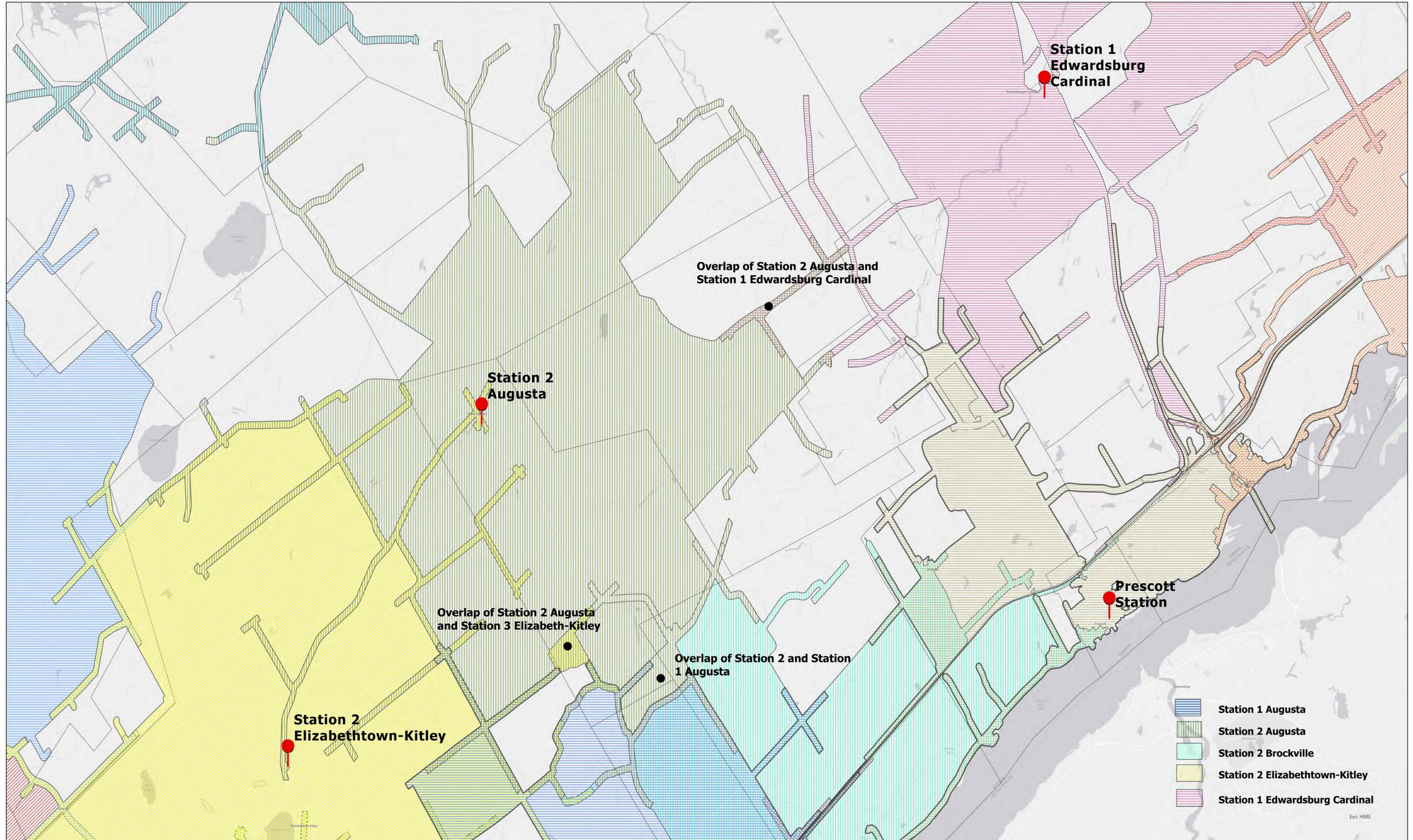
10 minute travel time from Athens Station



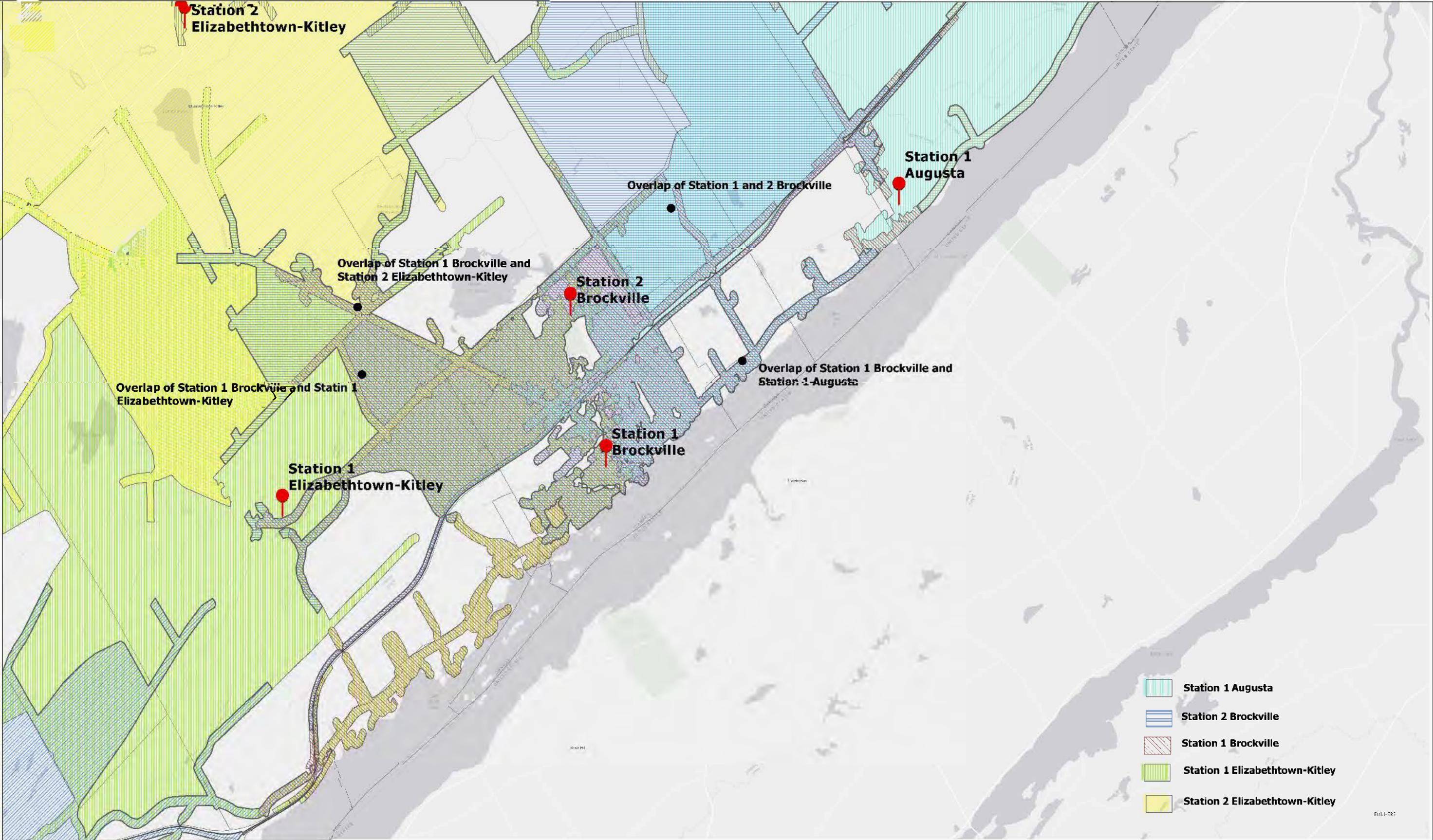
10 minute travel time from Station 1 Augusta



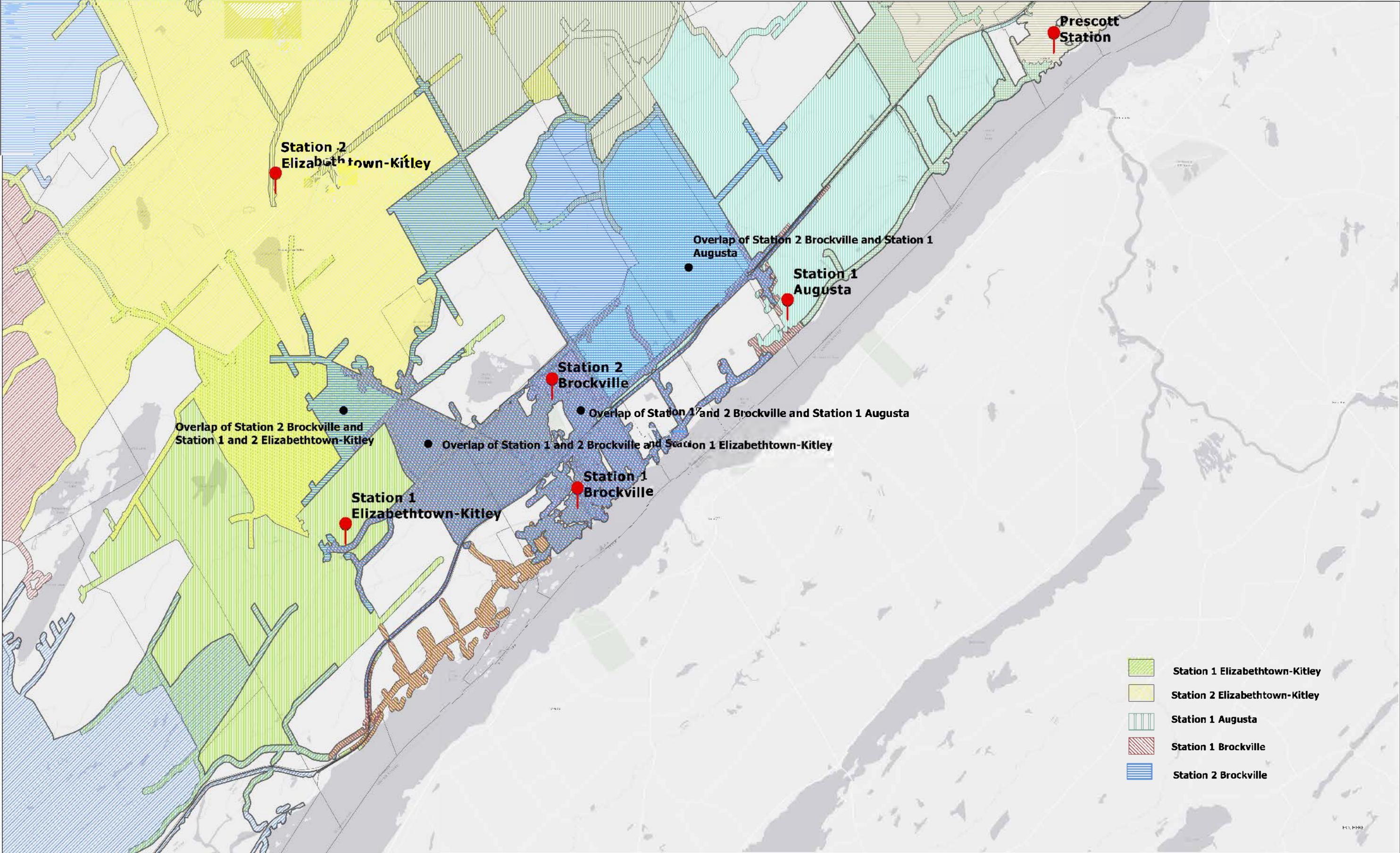
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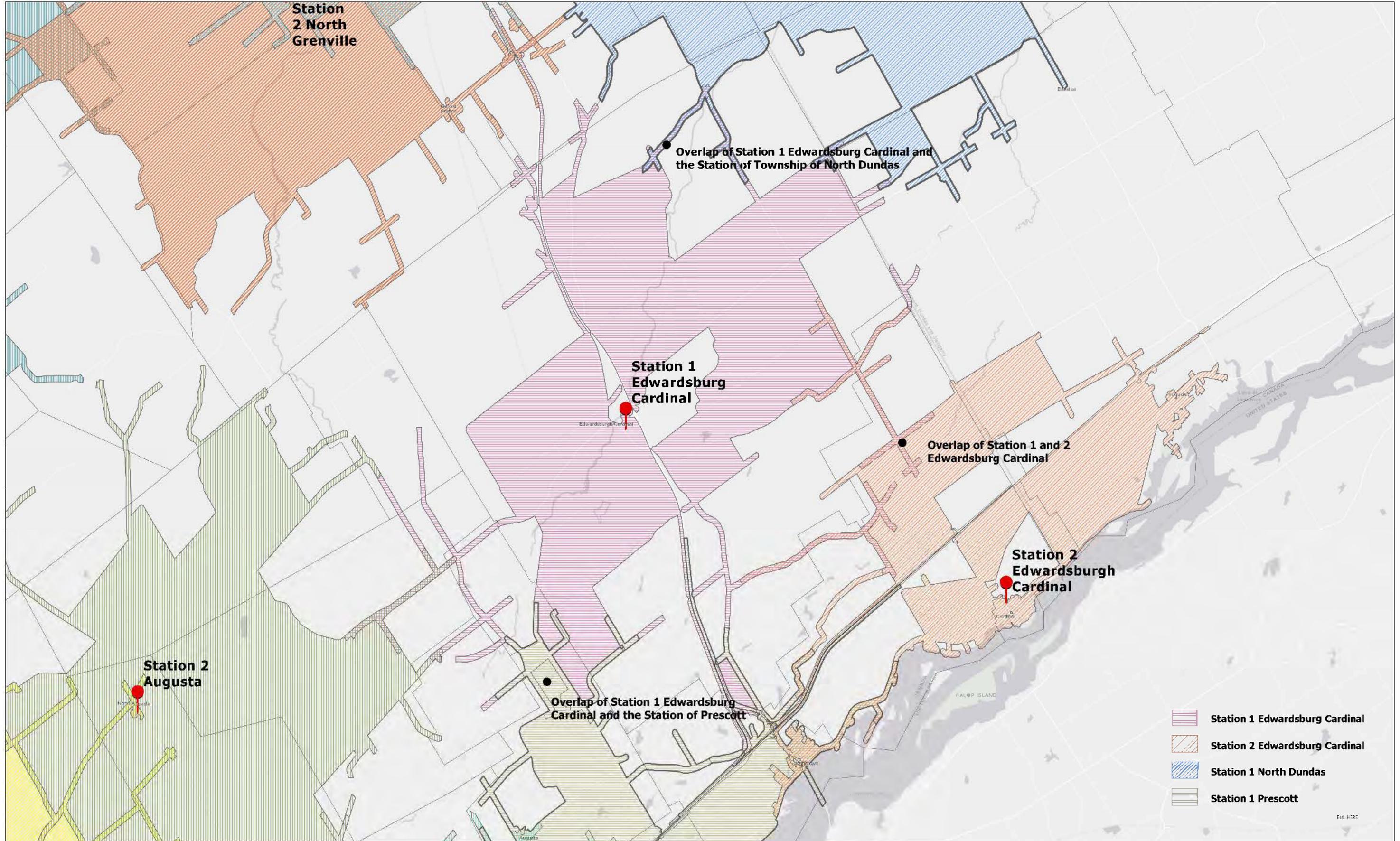
10 minute travel time for Station 1 Brockville



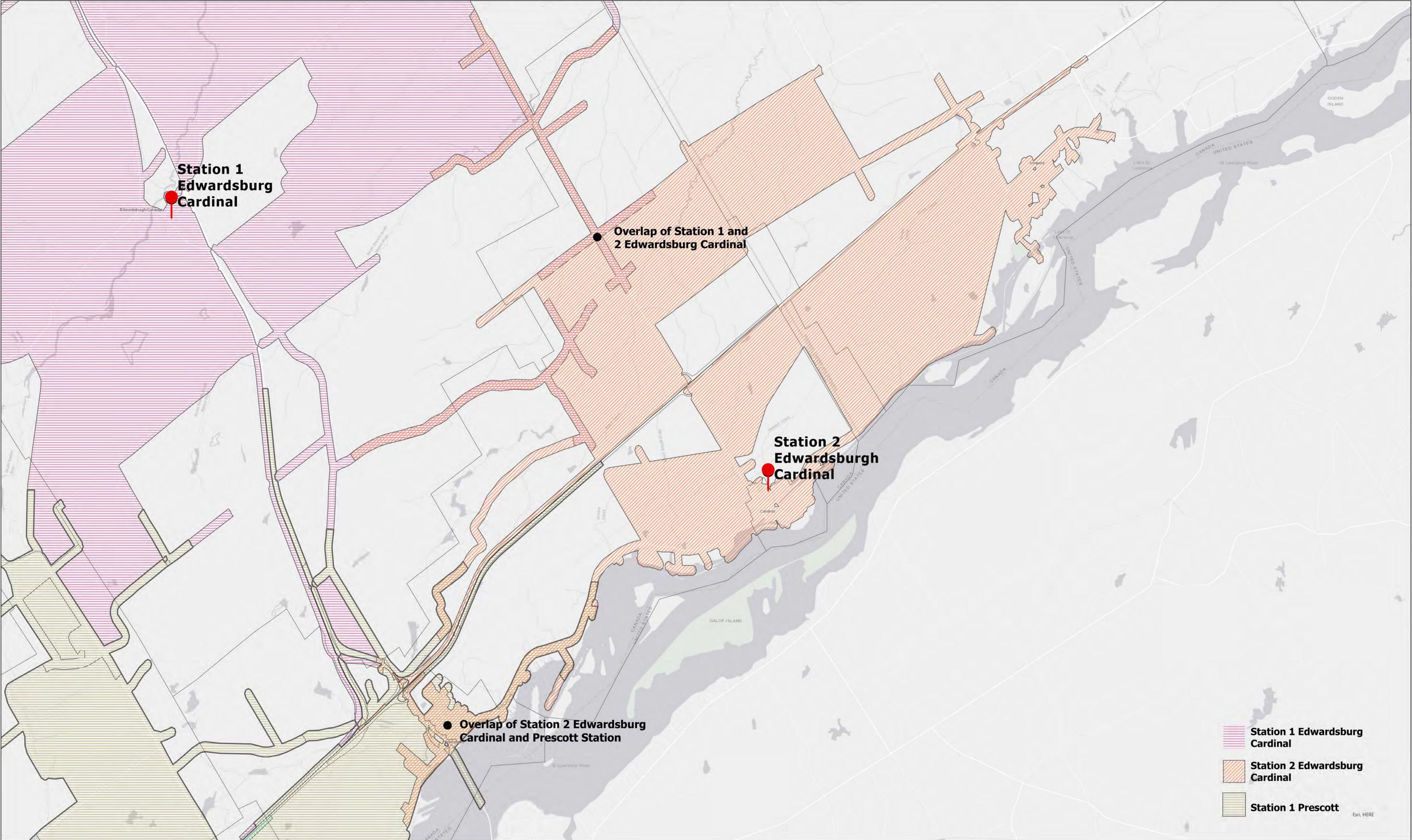
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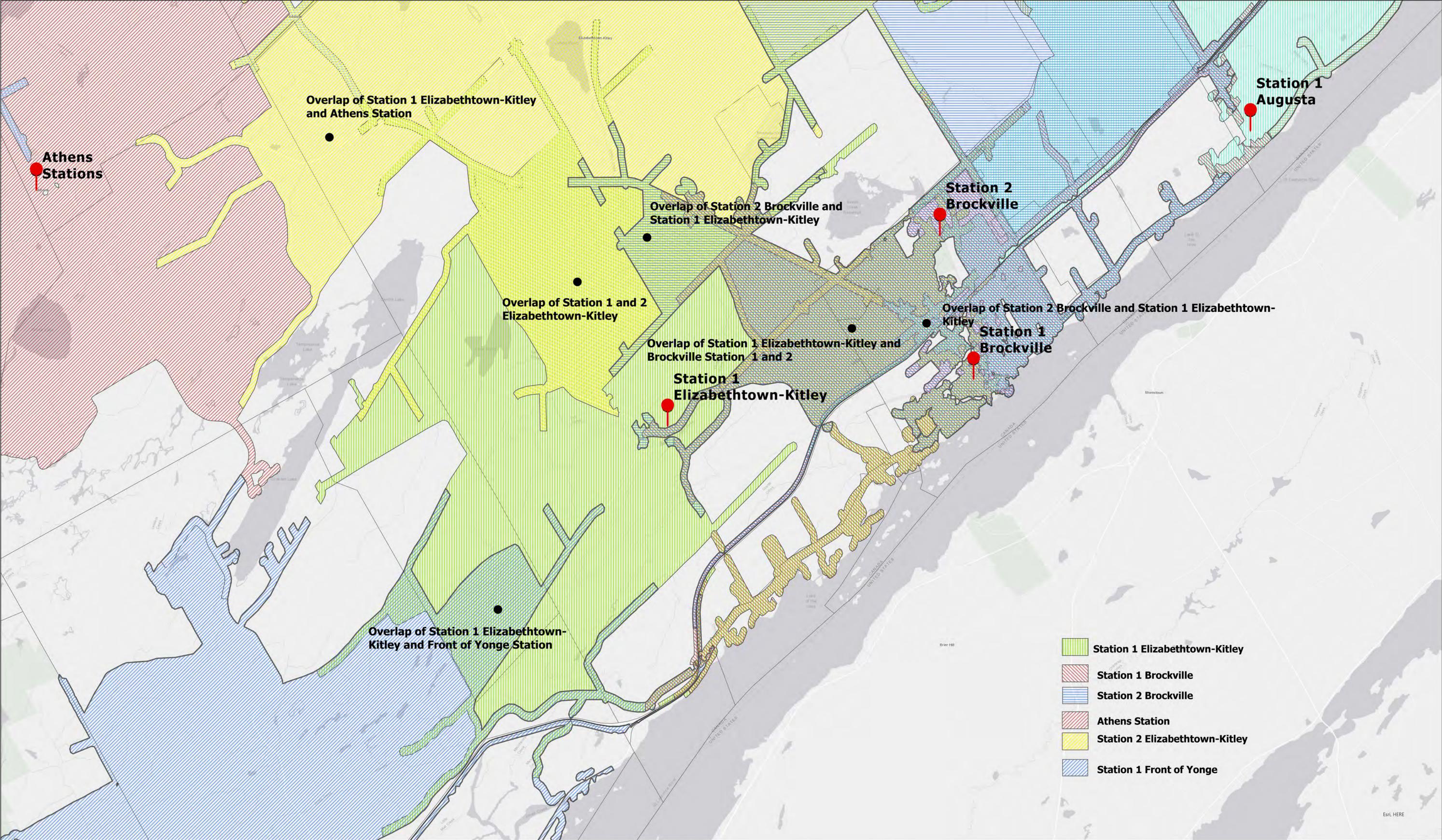
10 minute travel time from Station 1 Edwardsburg Cardinal



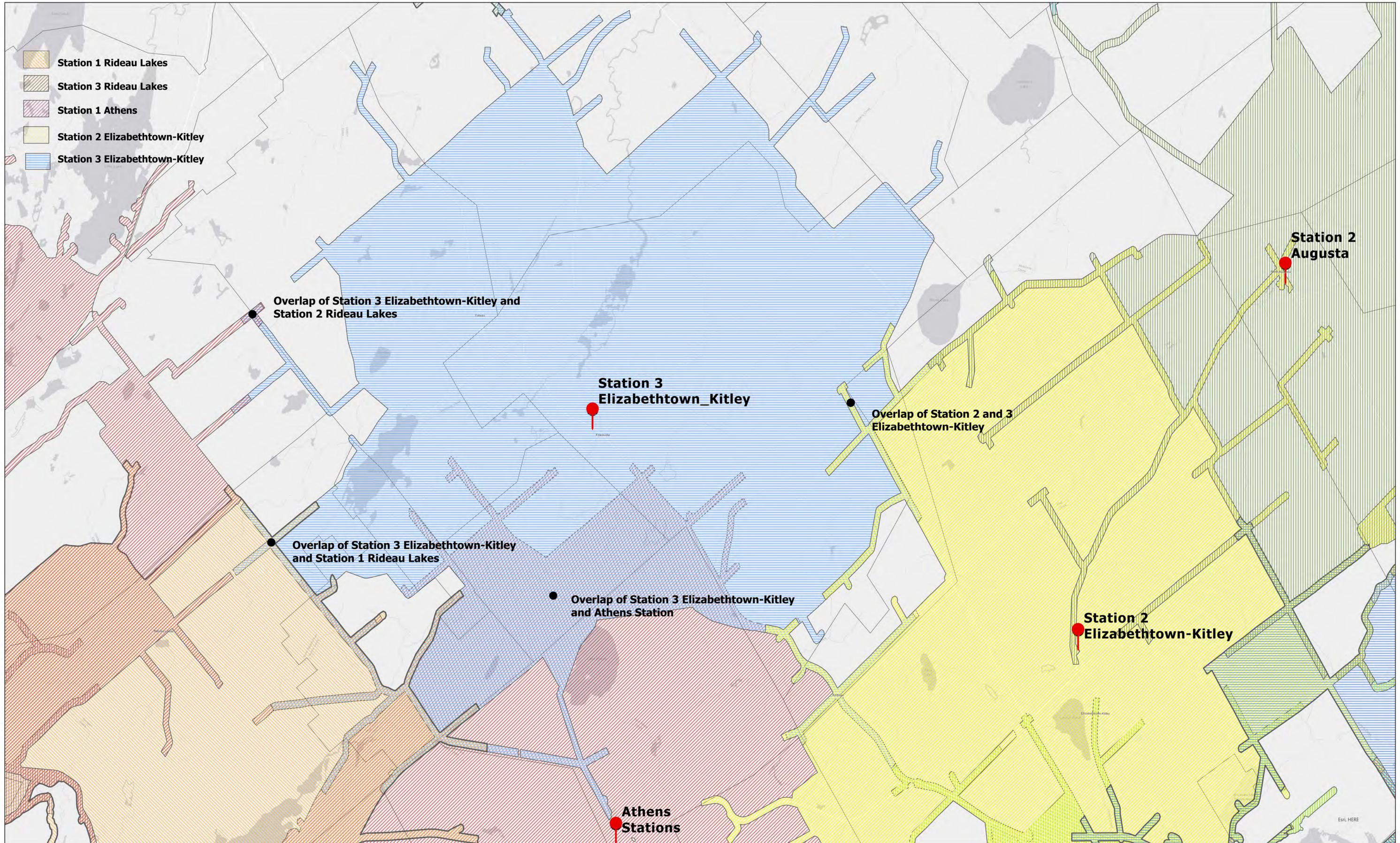
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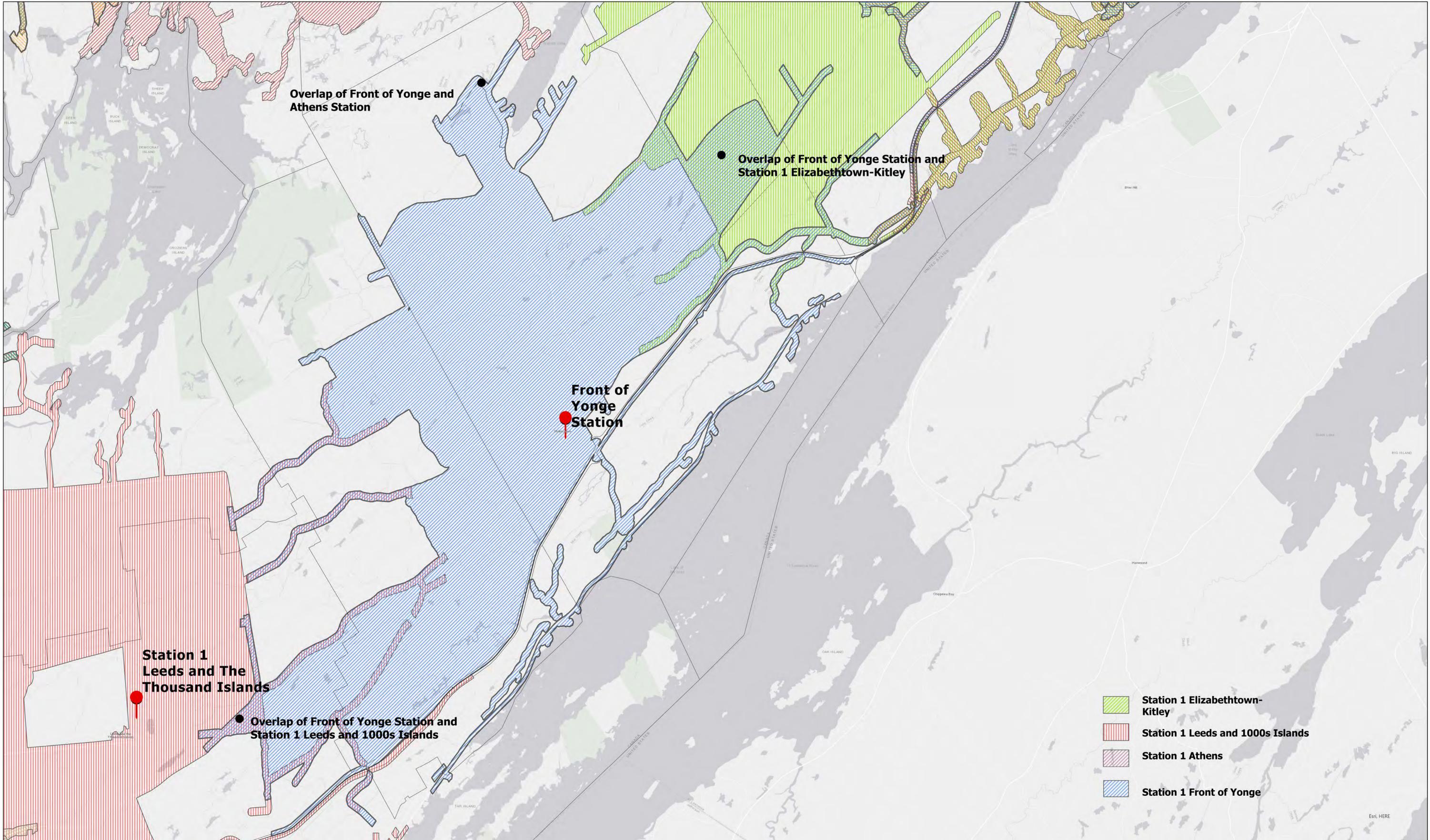
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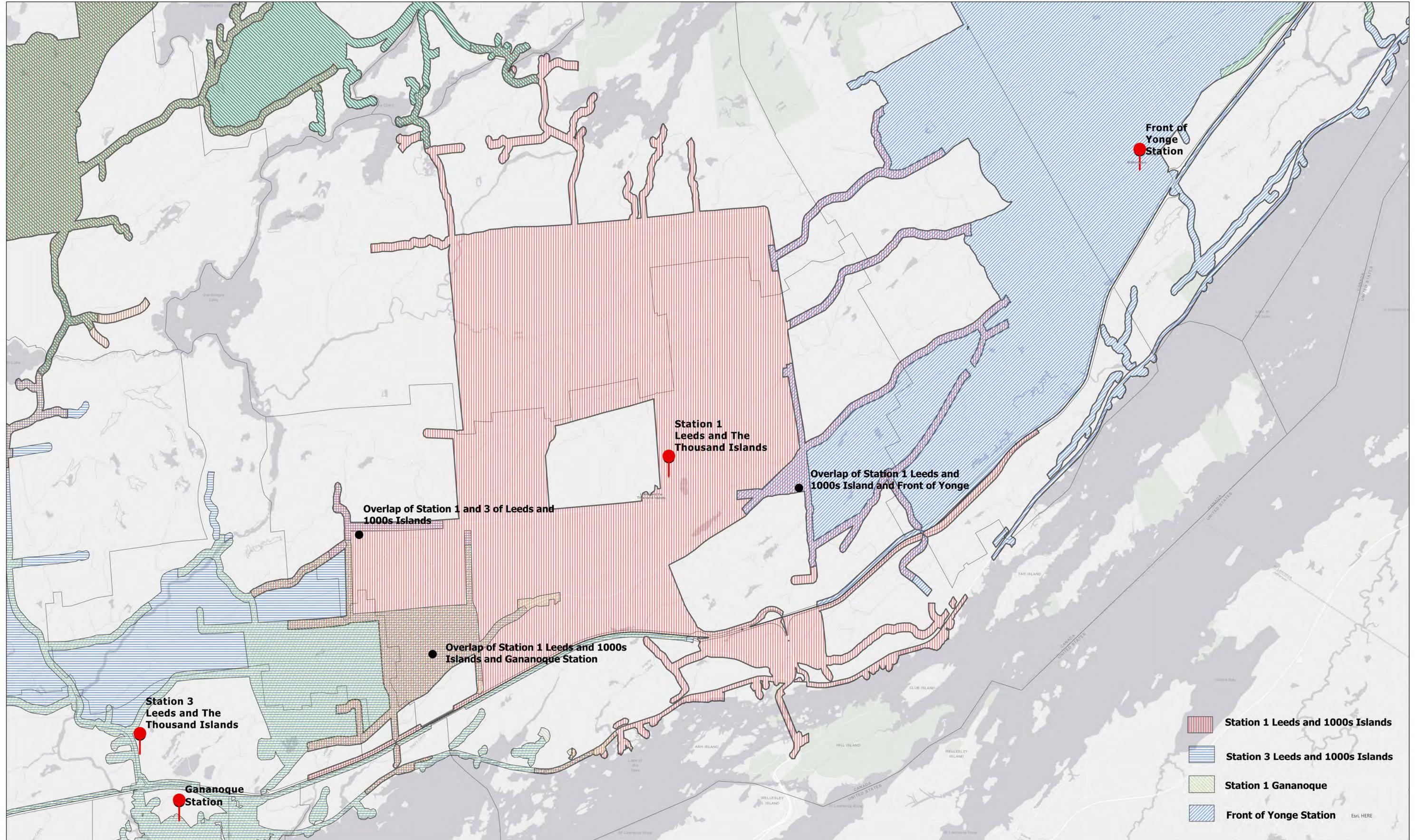
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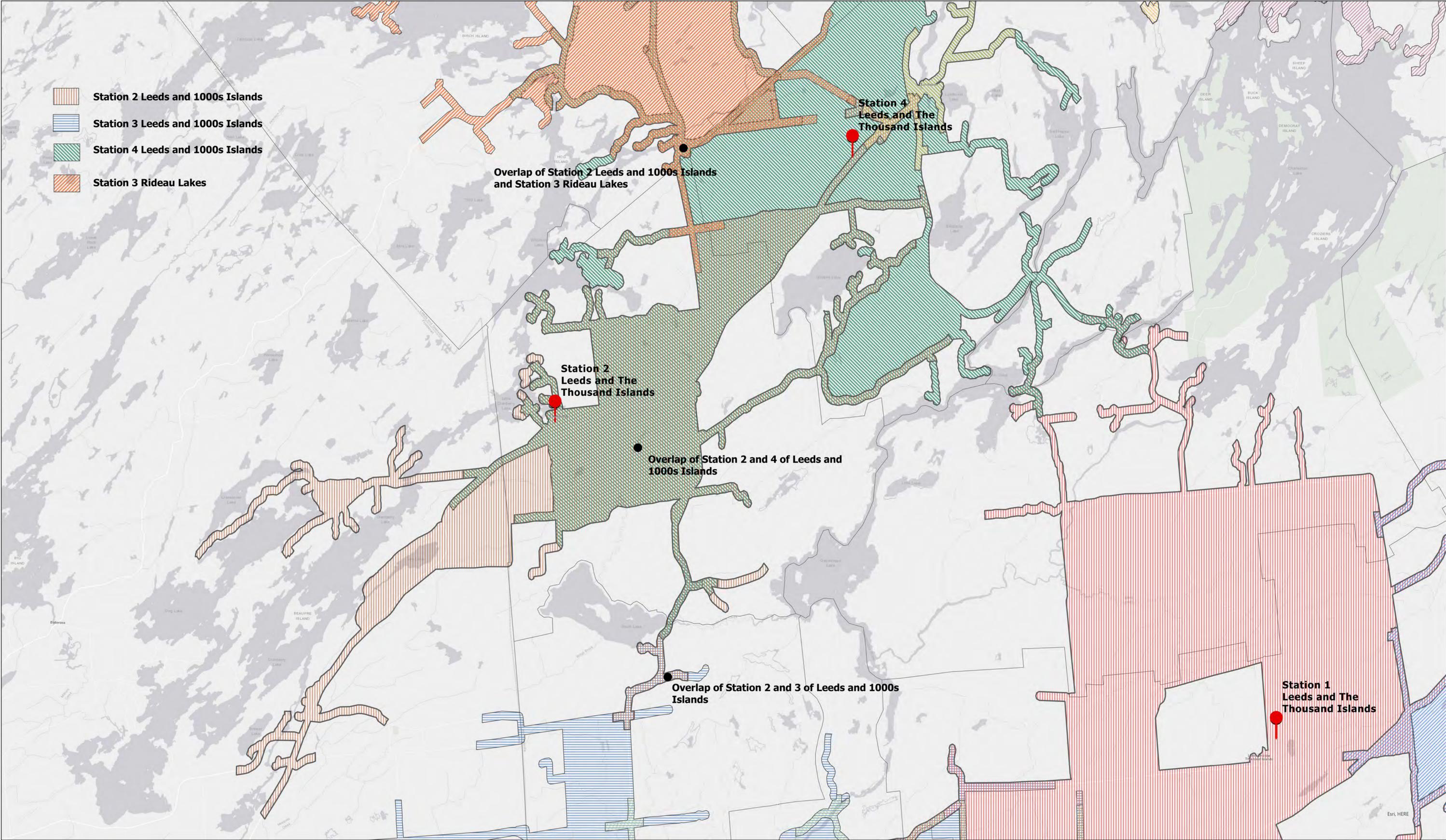
10 minute travel time from Front of Yonge Station



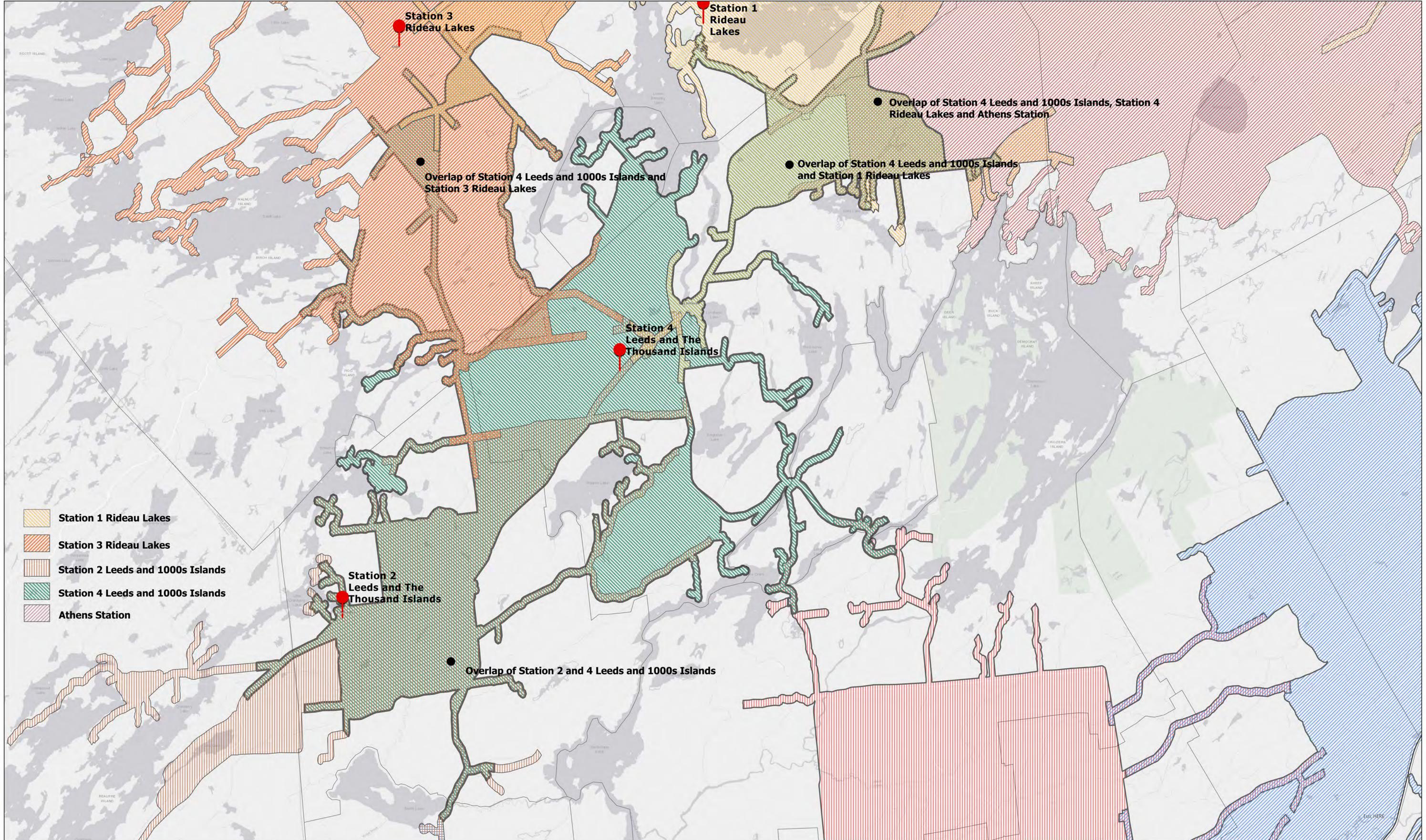
10 minute travel time from Station 1 Leeds and The Thousand Islands



10 minute travel time from Station 2 Leeds and The Thousand Islands



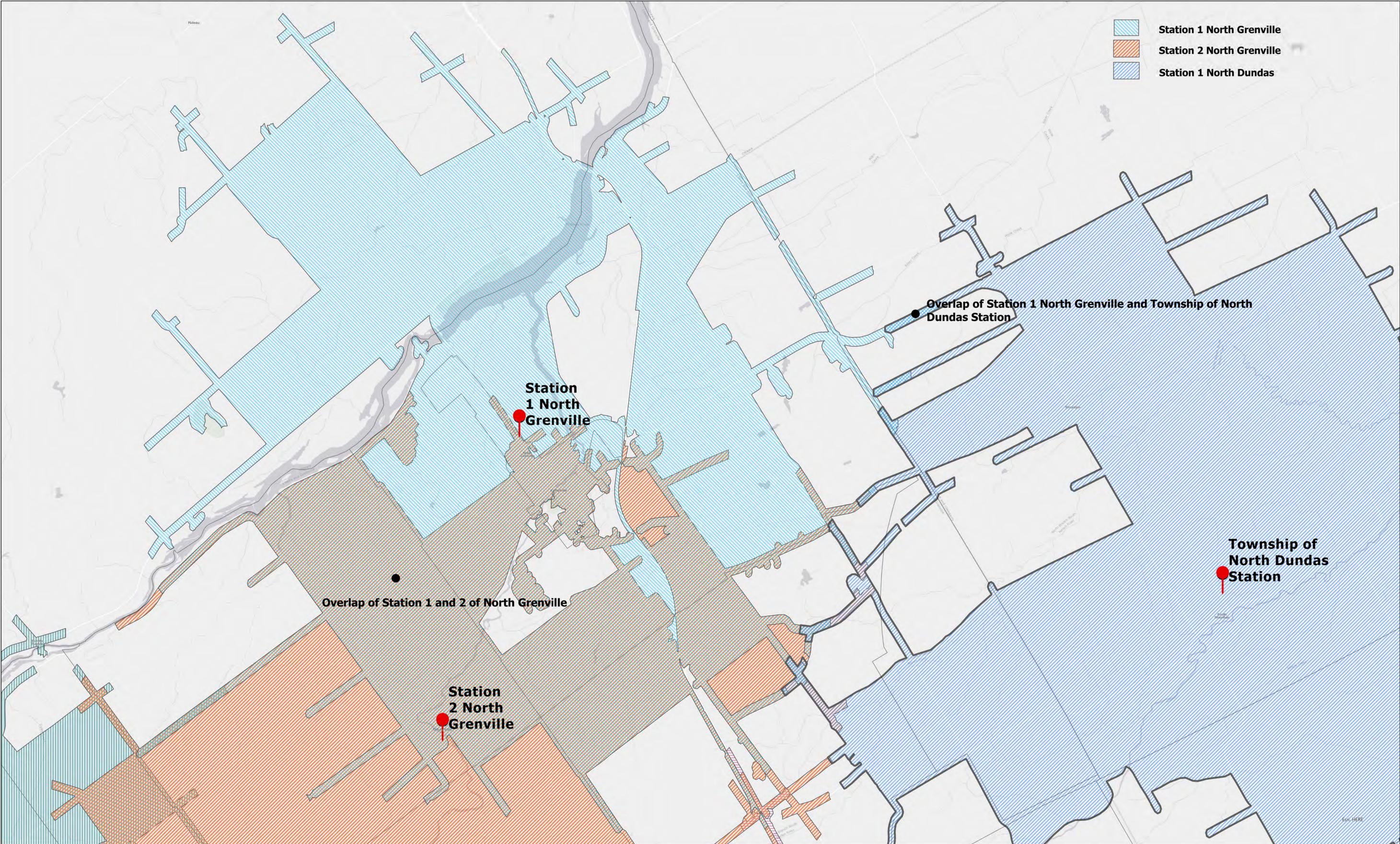
10 minute travel time from Station 4 Leeds and The Thousand Islands



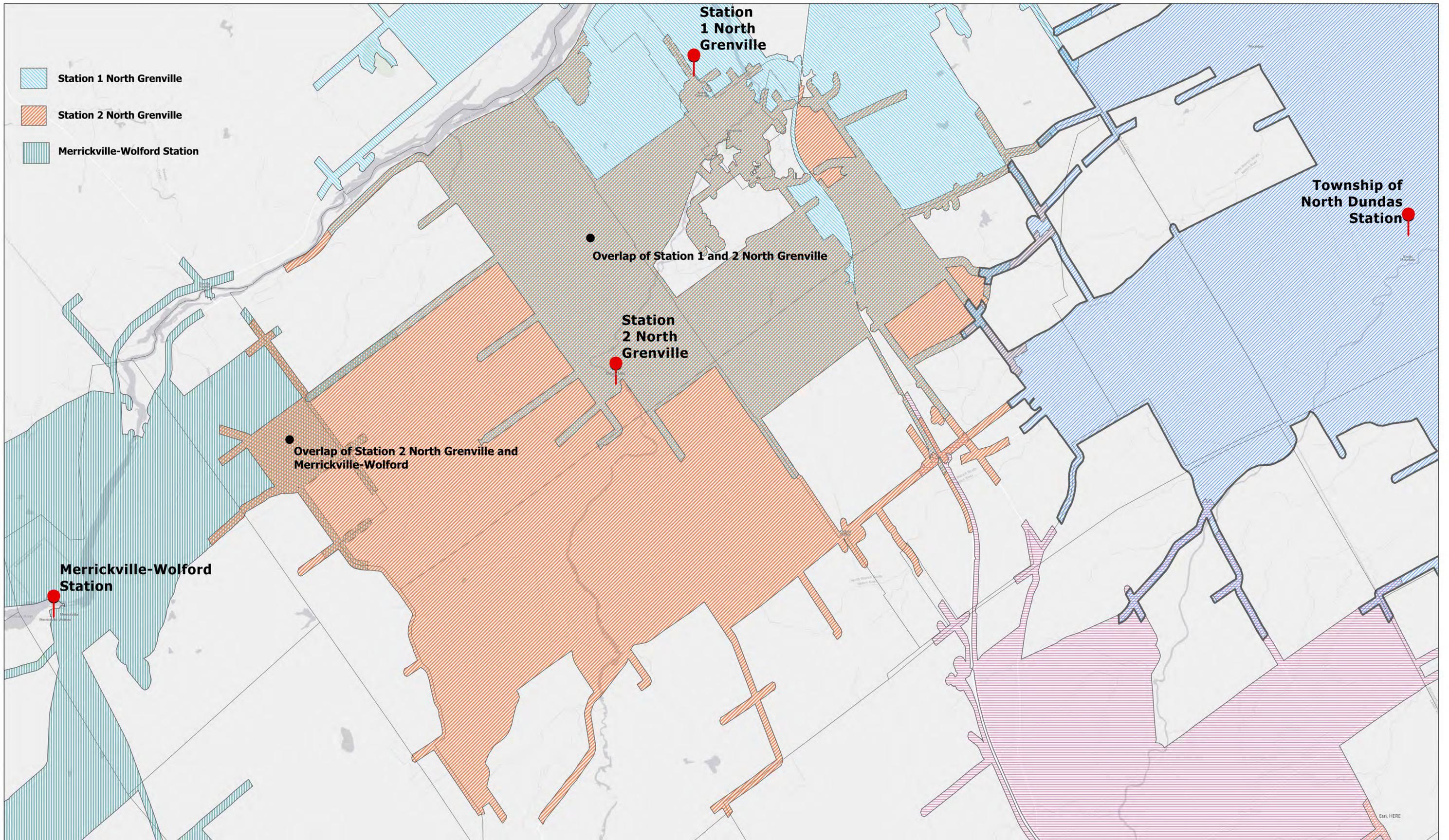
10 minute travel time from Merrickville-Wolford Station



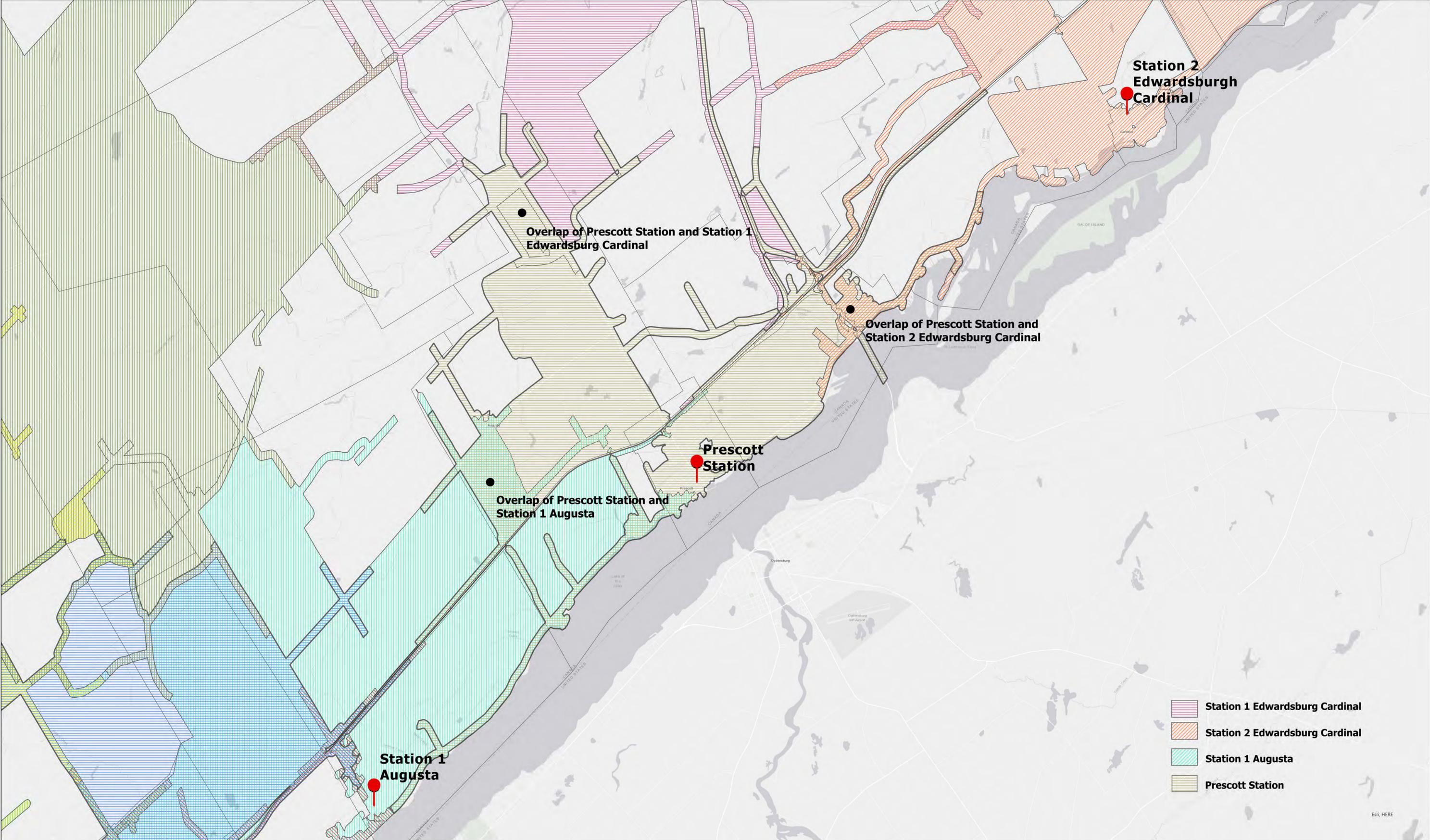
10 minute travel time from Station 1 North Grenville



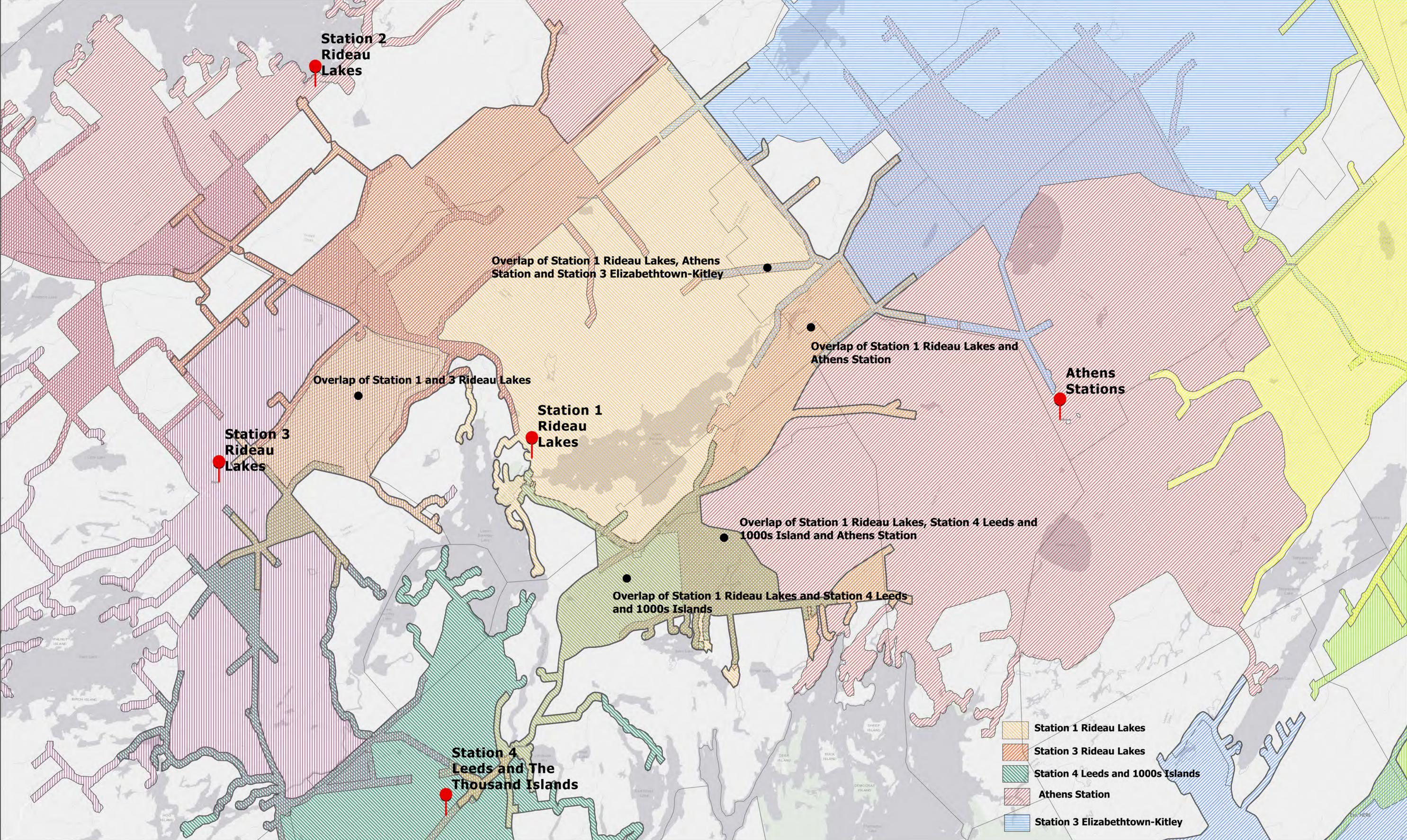
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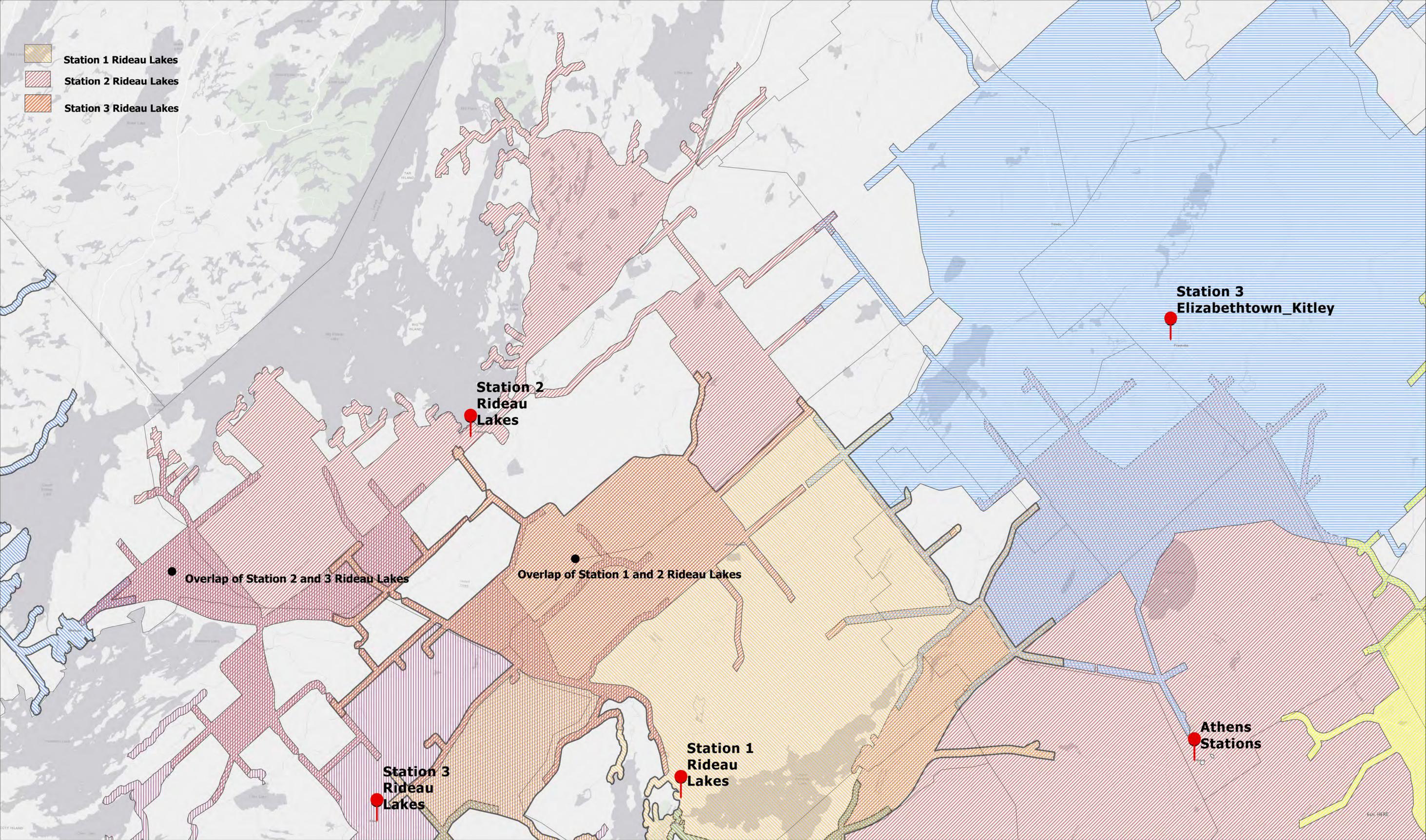
10 minute travel time from Prescott Station



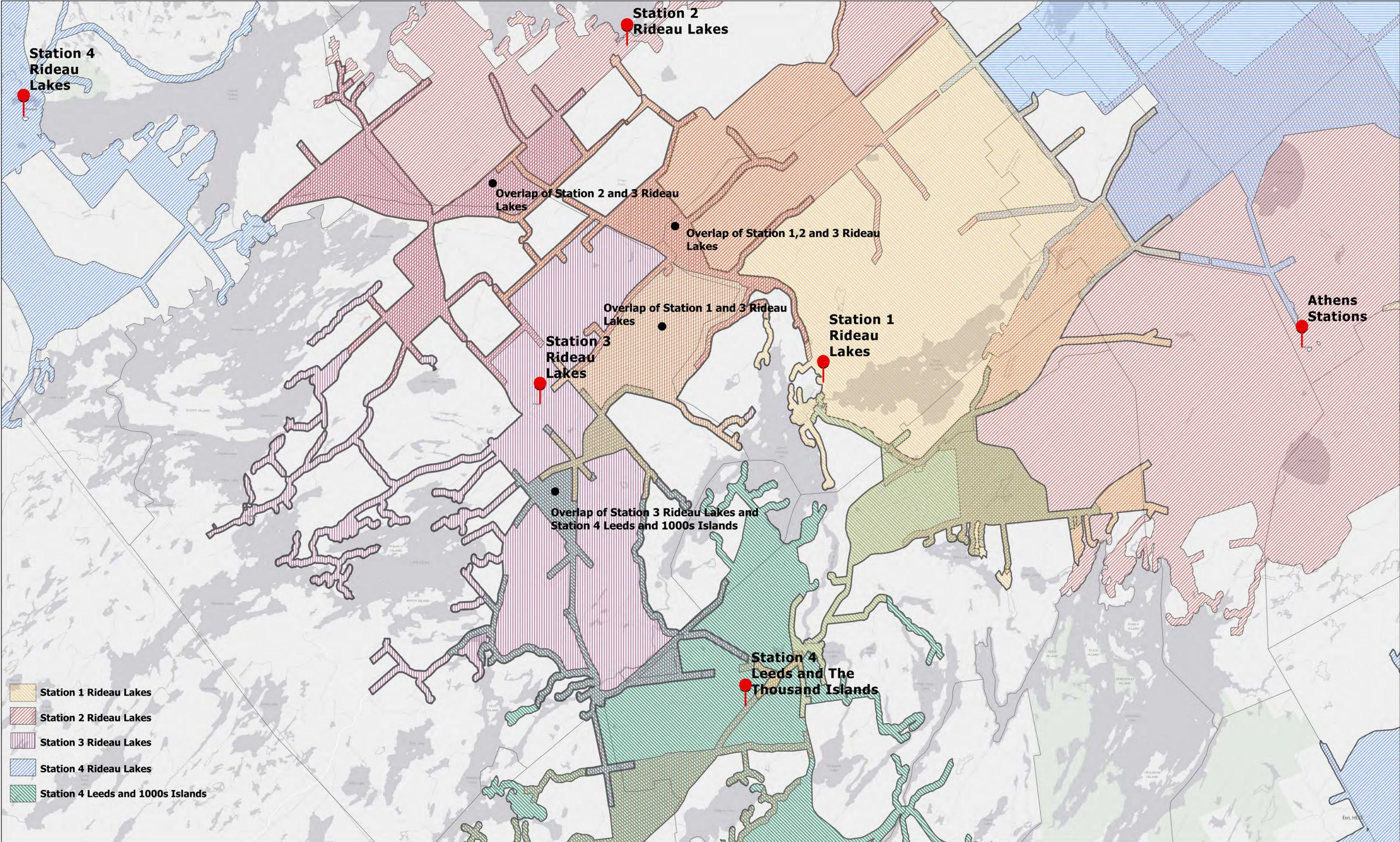
10 minute travel time from Station 1 Rideau Lakes



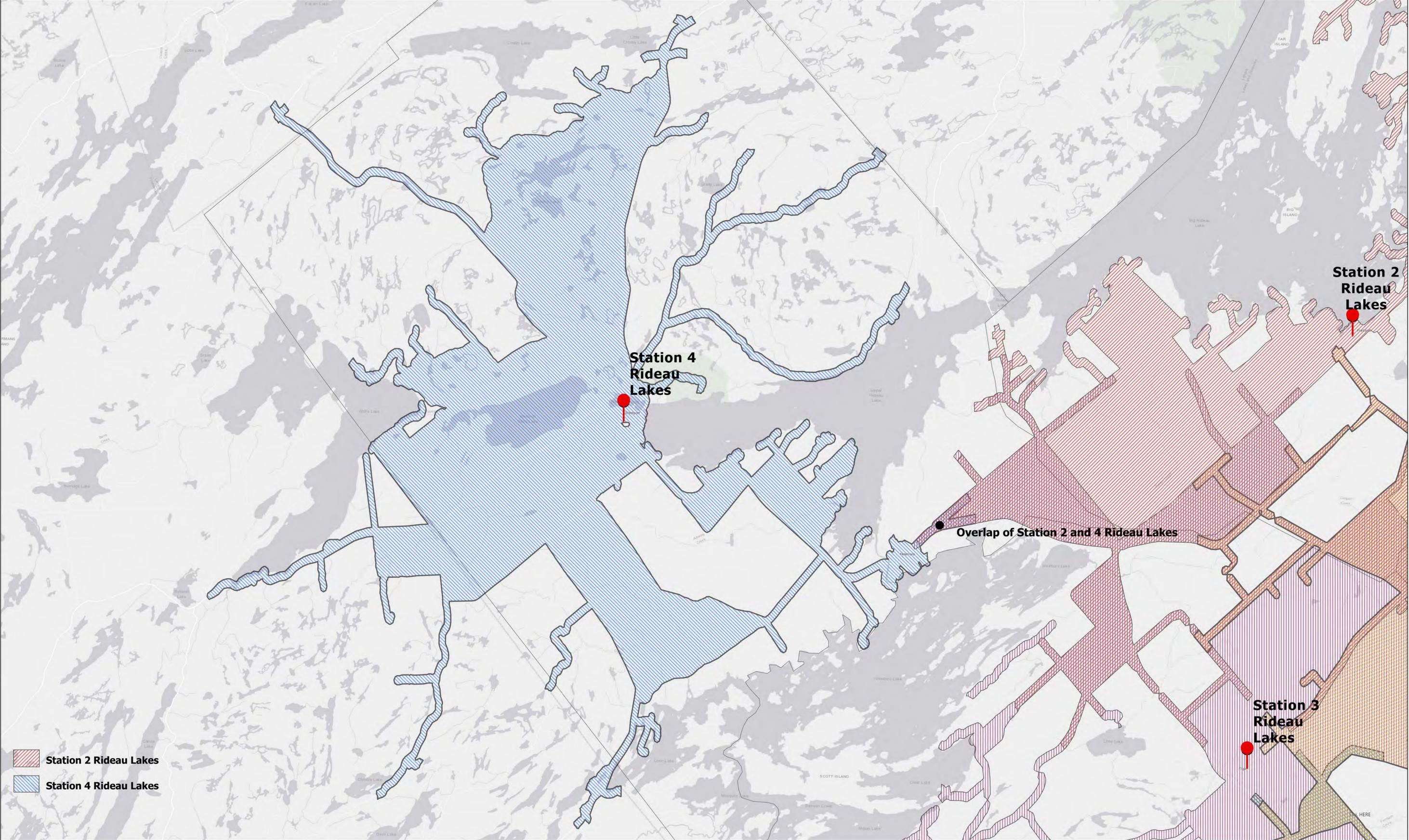
10 minute travel time from Station 2 Rideau Lakes



10 minute travel time from Station 3 Rideau Lakes



10 minute travel time for Station 4 Rideau Lakes



9. Appendix D: Incidents per Population

The tables in this appendix, starting on the following page, show the frequency of four incident types associated with a 'population factor'. The 'population factor' is simply the number of incidents in 2019 divided into the estimated population for that year. The source of the population number is either StatCan or estimates from the municipality.

As an example, in 2019, dispatch data for Athens indicated 12 unique fire response incidents. We explained in [Section 2 a\) i](#) why our incident count might be different than those reported to councils. The number of unique fire incidents recorded in 2019 is divided into the 2019 population estimate resulting in the population per fire incident. So, there was one fire incident for every 328.50 people in Athens. The higher the population factor number, the better the performance. North Grenville has the highest population factor with respect to fires which might indicate the fire services' efforts towards public education and prevention result in success.

But the "higher the population factor number, the better the performance" might be attributable to several factors. Turning to Remote Alarms (the fourth table on the following pages) we see that Athens has very few remote alarm occurrences. Is this due to Athens having done a very good job of educating alarm owners about the danger and inconvenience of false alarm notifications, or is there a steep penalty to false alarm activation in the municipality, or is it because there are few alarms installed in the community? The reasons for variances between municipalities may reveal, upon comparison, ideas for improving effectiveness and efficiency.

As well, the method of allocating and recording incident types may be an influence on population factors. If we look at the motor vehicle collisions (MVC) table it shows that Gananoque responded to only three motor vehicle collisions in 2019. But further analysis, not shown in these tables, reveals that Gananoque responds to a high number of 'Assistance' incidents which includes assisting paramedics and police at motor vehicle collisions. This variance in incident categorization extends to other major incident types and underlines the need for consistency in gathering response and outcome data.

Another example takes us back to the Fires table. Brockville, with a population of 21,854, registered 62 unique responses to reported fires in 2019. Gananoque, with about a quarter of the population, reported 61 fire responses. Elizabethtown-Kitley with 45% of the population of Brockville reportedly responded to 65 unique fire events. We are unable to determine if these differences are attributable to public education and prevention efforts, reporting variances (which shouldn't be because Brockville also dispatches Elizabethtown-Kitley), or another factor but this presents another argument in favor of centralized, consistent, dedicated data gathering and assessment.

Values for 2020 in the following tables represent only five months of data.

Fires							Population Factor	
	2015	2016	2017	2018	2019	2020	Population	2019
Athens	7	19	13	12	12	5	3,942	328.50
Augusta	36	42	36	48	47	25	7,234	153.91
Brockville	66	75	67	78	62	35	21,854	352.48
Edwardsburgh	41	48	43	51	35	24	7,234	206.69
Elizabethtown-Kitley	48	54	43	55	65	28	9,854	151.60
Front of Yonge	22	25	16	22	23	14	5,710	248.26
Gananoque	31	57	40	32	61	21	5,159	84.57
Leeds and Thousand Islands	58	72	56	61	63	43	9,465	150.24
Merrickville	20	19	15	21	17	12	3,067	180.41
North Grenville	45	61	36	60	41	30	16,451	401.24
Prescott	20	19	15	21	25	4	3,965	158.60
Rideau Lakes Westport	43	61	52	53	46	34	10,797	234.72

A higher population factor number = better performance.

Medical							Population Factor	
	2015	2016	2017	2018	2019	2020	Population	2019
Athens	15	20	28	25	15	5	3,942	262.80
Augusta	26	20	13	23	23	8	7,234	314.52
Brockville	112	191	193	191	216	80	21,854	101.18
Edwardsburgh	32	37	39	25	31	8	7,234	233.35
Elizabethtown-Kitley	48	38	35	41	45	17	9,854	218.98
Front of Yonge	13	17	11	16	14	3	5,710	407.86
Gananoque	54	56	50	50	34	6	5,159	151.74
Leeds and Thousand Islands	83	67	50	67	45	25	9,465	210.33
Merrickville	18	15	11	13	9	11	3,067	340.78
North Grenville	53	69	75	64	62	24	16,451	265.34
Prescott	18	35	32	36	38	16	3,965	104.34
Rideau Lakes Westport	72	100	86	80	65	20	10,797	166.11

A higher population factor number = better performance.

MVC							Population Factor	
	2015	2016	2017	2018	2019	2020	Population	2019
Athens	5	8	10	7	8	4	3,942	492.75
Augusta	18	14	27	23	22	1	7,234	328.82
Brockville	39	44	68	60	74	19	21,854	295.32
Edwardsburgh	16	35	31	37	30	10	7,234	241.13
Elizabethtown-Kitley	24	21	40	25	31	13	9,854	317.87
Front of Yonge	17	22	20	15	18	7	5,710	317.22
Gananoque	2	4	2	10	3	2	5,159	1719.67
Leeds and Thousand Islands	46	52	37	43	56	11	9,465	169.02
Merrickville	5	9	3	6	9	5	3,067	340.78
North Grenville	31	39	46	41	47	1	16,451	350.02
Prescott	8	19	25	25	27	3	3,965	146.85
Rideau Lakes Westport	14	27	32	28	25	11	10,797	431.88

A higher population factor number = better performance.

Remote Alarm							Population Factor	
	2015	2016	2017	2018	2019	2020	Population	2019
Athens	7	9	5	8	3	0	3,942	1314.00
Augusta	18	13	24	20	20	6	7,234	361.70
Brockville	317	277	334	309	295	74	21,854	74.08
Edwardsburgh	24	17	15	22	10	4	7,234	723.40
Elizabethtown-Kitley	28	13	35	22	18	5	9,854	547.44
Front of Yonge	5	4	3	10	8	1	5,710	713.75
Gananoque	59	55	52	50	53	19	5,159	97.34
Leeds and Thousand Islands	26	16	35	31	38	6	9,465	249.08
Merrickville	15	16	14	11	17	4	3,067	180.41
North Grenville	59	56	92	83	92	26	16,451	178.82
Prescott	35	32	40	34	29	8	3,965	136.72
Rideau Lakes Westport	28	24	38	32	34	7	10,797	317.56

A higher population factor number = better performance.

10. Appendix E: Fleet and Equipment

Community	Type	Pumping Capacity	Water Tank	Year	Manufacturer	Fire Apparatus	Pickups	Operations Trailer	Utility Terrain Vehicle	Boats/Boat Trailers	Elevated Devices ⁴	Ladder Height (feet)
					Totals	88	31	10	10	20	6	
Brockville												
Station #1	Pumper-Rescue P-1	5000	3500	2017	E-One	1						
	Pumper	5000	2800	2003	Pierce	1						
	Rescue R-7	N/A	N/A	1990	GMC	1						
Station #2												
	Pickup - Command	N/A	N/A	2019	Chev		1					
	Aerial Platform A-5	5000	1000	2017	E-One	1					1	100
	Aerial Ladder L3	6000	1500	2014	Rosenbauer	1					1	78
	Pickup T-1	N/A	N/A	2018	Chev		1					
	Pickup T-2	N/A	N/A	2017	Chev		1					
	Pickup T-3	N/A	N/A	2016	Chev		1					
	Pickup T-4	N/A	N/A	2017	Chev		1					
	Training Pumper					1						
	Emergency Ops Trailer	N/A	N/A					1				
Elizabethtown-Kitley												
Station #1 - Lyn												
	Pumper P-1	4500	4000	2018	Fort Garry	1						
	Tanker T-1	Vacuum	13000	2017	Carl Thibault	1						
	Rescue R-1 (heavy Rescue)	N/A	N/A	2005	Dependable	1						
	Rescue/Medical R-5	N/A	N/A	2010	Ford - Crestline	1						
	Pickup - Chief	N/A	N/A	2016	Dodge 4X4		1					
	Pickup - Deputy Chief	N/A	N/A	2017	Dodge 4X4		1					
Station #2 - New Dublin												
	Tanker T-2	Vacuum	9000	2000		1						
	Pumper P-2	4500	4000	2008	Fort Garry	1						
	Reserve Pumper	4500	5000	1997	Fort Garry	1						
	Rescue/Pickup	N/A	N/A	2008	Chev 4X4		1					
Station #3 - Franktown												
	Pumper -3	4500	4500	2011	Fort Garry	1						

⁴ Included in the total count of fire apparatus

Community	Type	Pumping Capacity	Water Tank	Year	Manufacturer	Fire Apparatus	Pickups	Operations Trailer	Utility Terrain Vehicle	Boats/Boat Trailers	Elevated Devices ⁴	Ladder Height (feet)
	Tanker T-3	Vacuum	9000	1997	Almonte Fire Trucks	1						
	Rescue R-3	N/A	N/A	1995	Dependable	1						
	Pickup - Personnel T-3	N/A	N/A	2017			1					
Rideau Lakes												
Station #1 - Delta												
	Pumper #81	3600	2200	2000	Asphodel GMC	1						
	Tanker #91	Port. Pump	6600	1999	Thibault	1						
	Pickup #111	N/A	N/A	2018	Ford		1					
Station #2 - Portland												
	Pumper #82	5500	4500	2009	Thibault	1						
	Tanker #92	Port. Pump	11000	2009	Thibault	1						
	Rescue #72 - heavy	N/A	N/A	2009	Thibault	1						
	Boat Marine 2	N/A	N/A	2007	Yamaha G3 19'					1		
	Trailer for Marine 2	N/A	N/A							1		
Station #3 - Elgin												
	Pumper #83	5000	4500	2020	Battleshield	1						
	Tanker #93	Port. Pump	6600	1999	AFT	1						
	Mini pump #63	Port. Pump	660	2016	Ford	1						
	Rescue #73	N/A	N/A	2009	Thibault	1						
	Rehab #60	N/A	N/A	2017	Ford	1						
	Boat Marine 3	Port. Pump	N/A	1995	Flotr Sunliner					1		
	Trailer	N/A	N/A	1999	Bear					1		
	Pickup	N/A	N/A	2016	Ford		1					
Station #4 - Westport												
	Pumper #84	4500	4000	2000	Superior	1						
	Tanker #94	Port. Pump	11000	2009	Thibault	1						
	Rescue - heavy #74	N/A	N/A	1999	AFT	1						

Community	Type	Pumping Capacity	Water Tank	Year	Manufacturer	Fire Apparatus	Pickups	Operations Trailer	Utility Terrain Vehicle	Boats/Boat Trailers	Elevated Devices ⁴	Ladder Height (feet)
	Truck	N/A	N/A	2011	Chev		1					
	UTV -rescue #24	N/A	N/A	2016	Honda				1			
	Trailer for UTV			2018					1			
Leeds/Thousand Islands												
Station #1 - Lansdowne												
	Pumper #10	5500	4000	2012	Crimson Spartan	1						
	Tanker #16	1300	8000	1997	Almonte Fire Trucks	1						
	Pumper/tanker #14	4000	11000	2007	Pierce	1						
	Tanker #12	1300	8000	2004	GMC Topkick	1						
	Rescue - Heavy #17	N/A	N/A	2005	Asphodel	1						
	Pickup - medical #18	N/A	N/A	2016	Chev		1					
	Pickup T-1	N/A	N/A	2010	Chev		1					
	Boat M-1	N/A	N/A	1998	Princecraft 19'6"					1		
	Boat trailer M-1	N/A	N/A	2000	EZLR					1		
	ATV	N/A	N/A	2011	Kawasaki				1			
	Lightweight trailer	N/A	N/A	2005	Aero					1		
	Boat- M5 in water	N/A	N/A	2002	24' Stanley					1		
	Trailer M-5	N/A	N/A	2002						1		
	Forest Fire Trailer	N/A	N/A	2009	Red Elk			1				
	Command Trailer	N/A	N/A					1				
Station #2 - Seeleys Bay												
	Pumper #20	4600	4000	2000	Superior	1						
	Pumper-Mini CAFS #21	2200	1000	2005	Ford	1						
	Pickup - medical #28	N/A	N/A	2011	Chev		1					
	Pumper/Tanker #22	3700	11000	2007	Pierce	1						
	Boat -M4	N/A	N/A	1992	17'6"					1		
	Trailer M4	N/A	N/A	1992	EZLR					1		
Station #3 - Cheeseborough												
	Pumper #30	6600	4000	2017	HME	1						
	Tanker #32	6600	11000	2019	Battleshield	1						
	Pickup - medical #38	N/A	N/A	2016	Chev		1					

Community	Type	Pumping Capacity	Water Tank	Year	Manufacturer	Fire Apparatus	Pickups	Operations Trailer	Utility Terrain Vehicle	Boats/Boat Trailers	Elevated Devices ⁴	Ladder Height (feet)
	Boat Trailer M-3	N/A	N/A	1999	EZLR					1		
	Boat- M-3	Port. Pump	N/A	1999	Princecraft 19'6"					1		
	Trailer/Forest fire & ice water	N/A	N/A					1				
	ATV	N/A	N/A	2011	Kawasaki				1			
	Trailer	N/A	N/A	2010	Haulmark				1	1		
	Trailer with Generator	N/A	N/A									
Station #4 - Lyndhurst												
	Pumper #40	4600	4500	2004	Thibault	1						
	Tanker #42	3700	6600	2007	Pierce	1						
	Rescue #47	N/A	N/A	2003	Almonte Fire Trucks	1						
	Pickup - medical	N/A	N/A	2016	Chev		1					
	UTV - side by side	N/A	N/A	2011	Kawasaki				1			
	Pickup - training	N/A	N/A	2003	Chev		1					
	Trailer with Generator	N/A	N/A							1		
	Training Pumper	4600	2000	1992	Nova Quintec	1						
	Training Tanker			1995		1						
Front of Yonge												
Mallorytown Station												
	Pumper P-6	4000	4500	1992	Fort Garry (GMC)	1						
	Pumper-Rescue P-1	4000	4500	2003	E-One (GMC)	1						
	Tanker	Port. Pump	6000	1999	Dependable	1						
	Tanker	Port. Pump	6000	2000	Dependable	1						
	Rescue - heavy R-4	N/A	N/A	2004	Asphodel (GMC)	1						
	Pickup	N/A	N/A	2016	Dodge Ram 4X4		1					
	Wildfire Trailer c/w Side by SideN/A	N/A	N/A		Kawasaki			1	1			
	Rescue-Medical R-7	N/A	N/A	2012	Ford Crestline	1						
Gananoque												
	Pumper	6000	3300	2019	Pierce	1						

Community	Type	Pumping Capacity	Water Tank	Year	Manufacturer	Fire Apparatus	Pickups	Operations Trailer	Utility Terrain Vehicle	Boats/Boat Trailers	Elevated Devices ⁴	Ladder Height (feet)
	Aerial Ladder	6000	900	2001	American LaFrance	1					1	75
	Personnel - Pickup	N/A	N/A	2013	Chev		1					
	Pumper	4500	2200	1999	American LaFrance	1						
	Trailer - Ice/Water rescue	N/A	N/A		Single axle			1				
	Trailer - Command/Rehab	N/A	N/A		Tandem axle			1				
	Boat - 24 '	N/A	N/A		Carolina Skiff					1		
	Boat Trailer									1		
North Grenville												
Station #1 Kemptville												
	Tanker			2000	International	1						
	Pumper/tanker P-1	4500	11000	2012	Arnprior	1						
	Pumper	4500	3500	1999	AFT	1						
	Rescue Pumper	4500	2600	2018	Arnprior	1						
	Rescue - for forest fire trailer	N/A	N/A	1991	International		1					
	Chief	N/A	N/A	2017	Chev		1					
	Deputy Chief	N/A	N/A	2015	Chev		1					
	Squad - Pickup/Medical	N/A	N/A	2017	Chev		1					
	Ladder-1 quint	6500	1300	2013	E-One	1					1	78
	ATV	N/A	N/A	2012					1			
	Trailer/Forestry	N/A	N/A	2012				1				
	Trailer/ Water Ice	N/A	N/A	2017				1				
Station #2 Oxford Mills												
	Pumper P-2			2020	Fort Garry	1						
	Tanker T-2	4500	13000	2015	Eastway	1						
Prescott												
	Pumper	6000	4000	2012	Rosenbauer	1						
	Rescue	N/A	N/A	1998	Superior	1						
	Aerial - Quint	8000	1300	2005	Sutphen	1					1	70
	Pickup	N/A	N/A	2012	GMC		1					
	Pickup	N/A	N/A	2017	Chev		1					
	Coast Guard inflatable	N/A	N/A							1		

Community	Type	Pumping Capacity	Water Tank	Year	Manufacturer	Fire Apparatus	Pickups	Operations Trailer	Utility Terrain Vehicle	Boats/Boat Trailers	Elevated Devices ⁴	Ladder Height (feet)
Athens												
	Tanker	Port. Pump	7500	2006	Almonte Fire Trucks	1						
	Pumper P-1	4000	3400	2007	Fort Garry	1						
	Pumper P-2	3000	3400	1992	Almonte Fire trucks (GMC)	1						
	Fortuna - inflatable	N/A	N/A							1		
	Rescue R-2	N/A	N/A	2008	Ford Crestline	1						
	R-1 Medical/Forestry	N/A	N/A	2006	Chev - Pickup		1					
Edwardsburgh-Cardinal Spencerville Station												
	Pumper P-1	5000	7000	2007	Seagrave	1						
	Pumper/tanker T-1	2000	14000	2013	Arnrior	1						
	Tanker T-3	3180	9460	2000	Dependable	1						
	Rescue R-1	N/A	N/A	1996	LaFleur (GMC)	1						
	Forest Fire Truck			2002	Almonte Fire Trucks	1						
Cardinal Station												
	Pumper P-4	6000	3590	2010	Dependable	1						
	Pumper/tanker T-7	4000	11000	2001	Fort Garry	1						
	Rescue R-5	N/A	N/A	2004	Fort Garry							
	Pickup	N/A	N/A	2010	Chev		1					
Augusta												
Station #1 - Maitland												
	Pumper	6600	4500	2016	Arnrior	1						
	Tanker	2000	11000	2002	Superior	1						
	Pumper - water source3000	3000	4500	1993	Superior	1						
	Rescue Van	N/A	N/A	2000	Chev		1					
	Rescue - heavy rescue	N/A	N/A	2007	Lafleur	1						
Station #2 - North Augusta												
	Pumper - CAFS	6600	3500	2018	Arnrior	1						

Community	Type	Pumping Capacity	Water Tank	Year	Manufacturer	Fire Apparatus	Pickups	Operations Trailer	Utility Terrain Vehicle	Boats/Boat Trailers	Elevated Devices ⁴	Ladder Height (feet)
	Tanker	Port. Pump	11000	2000	Superior	1						
	Rescue	N/A	N/A	2010	Lafleur	1						
	Pickup - medical	N/A	N/A	2009	Chev		1					
	UTV/Rescue & wildfire trailer	N/A	N/A	2013	Polaris			1	1			
Merrickville- Wolford												
Merrickville	Aerial	4500	1500	2006	Fort Garry	1					1	75
	Rescue - heavy rescue	N/A	N/A	2001	GMC	1						
	Tanker	Port. Pump	13000	1998	Fort Garry	1						
	Pumper/Tanker PT-1	4500	11000	2017	Arnprior	1						
	Pumper P-4	5000	3500	2013	Phoenix Spartan	1						
	Forest Fire truck	Port. Pump	1000	2008	Dodge	1						
	Pumper	4500	3500	1991	Spartan	1						
	Pickup	N/A	N/A	2017	Chev		1					
	UTV -all season rescue	N/A	N/A	2018	Can-Am				1			
	Fortuna - inflatable	N/A	N/A							1		

11. Appendix F Staff Survey Results

One hundred and forty eight of approximately 490 firefighters and fire staff answered the following survey although some did not answer all questions. That is about a 30% response rate which is not unusual for surveys. The following observations and percentages are based on the number of responses for each question. There are some notable response breakdowns:

1. 45.6% of respondents strongly agreed or somewhat agreed that a county training coordinator would improve training consistency among fire services compared to 30.6% who strongly disagreed or somewhat disagreed.
2. Only 29.3% of respondents strongly agreed or somewhat agreed that a standardized county-wide training curriculum provided by certified trainers, and replacing local training, would be more beneficial than the local training currently received compared to 44.2% who strongly disagreed or somewhat disagreed.
3. 66.7% strongly or somewhat agreed that a centralized training curriculum would enable firefighters to work more cohesively during mutual and automatic aid scenarios compared to just 15.6% who strongly or somewhat disagreed.
4. 44.1% of respondents strongly or somewhat agreed that firefighters should respond to medical incidents only if there is a confirmed indication that a patient is in critical condition while 44.8% strongly or somewhat disagreed, almost an even split.
5. Yet 60.1% of respondents strongly or somewhat agreed that firefighters should respond to all medical incidents in case they could assist. Somewhat of a contradiction to the earlier question. 28.4% strongly or somewhat disagreed.
6. 86.4% of respondents strongly or somewhat agreed that they should respond to all motor vehicle incidents in case they can assist. Only 11.6% strongly or somewhat disagreed.
7. 70.7% of respondents strongly or somewhat agreed that firefighters should attend motor vehicle incidents to provide safety blocking for other emergency services and provide roadway cleanup. 20.4% strongly or somewhat disagreed.
8. Encouragingly, 63.0% % of respondents strongly or somewhat agreed that they would be willing to commit an average of two to three hours a month to fire mitigation and safety training for the public (use of fire extinguishers, safety in the home or farm, first aid, promoting AEDs, other awareness training). 15.8% strongly or somewhat disagreed, and 21.2% were neutral.

The answers outlined above indicate that, for the most part, firefighters are interested in emergency response even though data and research conclude that such responses often cause greater risk than benefit. This is not an unexpected outcome and underlines the conundrum that people who choose to work in emergency services embrace the emergency and action part of the job, but the critical need in fire services are those people who are capable of saving lives through education and prevention. It is rare that a person who is interested in emergency service and response also has the aptitude to excel in education and prevention. But it was encouraging to see that almost 60% of respondents strongly or somewhat agreed that they would be willing to commit an average of two to three hours a month to public education and prevention. 17% strongly or somewhat disagreed.

The survey questions and results are shown below.

Question or Statement to be Rated	Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree	Number Responding	Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree	Strongly or somewhat agree	Strongly or somewhat disagree
a) When I joined the fire department I was welcomed as a valuable member of the organization:	102	28	7	3	8	148	68.9%	18.9%	4.7%	2.0%	5.4%	87.8%	7.4%
b) The current hiring process is well organized with a strong orientation process:	59	54	19	7	9	148	39.9%	36.5%	12.8%	4.7%	6.1%	76.4%	10.8%
i) A standardized county-wide training curriculum provided by certified trainers, and replacing local training, would be more beneficial than the local training currently received.	15	28	39	34	31	147	10.2%	19.0%	26.5%	23.1%	21.1%	29.3%	44.2%
ii) A county training coordinator would improve training consistency among fire services.	25	42	35	23	22	147	17.0%	28.6%	23.8%	15.6%	15.0%	45.6%	30.6%
iii) Training consistency among fire services is important in UCLG.	46	59	29	7	6	147	31.3%	40.1%	19.7%	4.8%	4.1%	71.4%	8.8%

Question or Statement to be Rated	Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree	Number Responding	Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree	Strongly or somewhat agree	Strongly or somewhat disagree
iv) A centralized training curriculum would enable firefighters to work more cohesively during mutual and automatic aid scenarios.	43	55	26	16	7	147	29.3%	37.4%	17.7%	10.9%	4.8%	66.7%	15.6%
i) We should respond to medical incidents only if there is a confirmed indication that a patient is in critical condition.	24	40	16	25	40	145	16.6%	27.6%	11.0%	17.2%	27.6%	44.1%	44.8%
ii) We should respond to all medical incidents in case we can assist.	58	31	15	25	17	146	39.7%	21.2%	10.3%	17.1%	11.6%	61.0%	28.8%
iii) We should respond to medical incidents only if an ambulance is going to be delayed.	17	29	24	40	36	146	11.6%	19.9%	16.4%	27.4%	24.7%	31.5%	52.1%
iv) We should not respond to any medical incidents.	1	2	12	12	117	144	0.7%	1.4%	8.3%	8.3%	81.3%	2.1%	89.6%
i) We should respond to motor vehicle accidents only if there is a confirmed indication that victims are trapped.	5	12	5	33	89	144	3.5%	8.3%	3.5%	22.9%	61.8%	11.8%	84.7%
ii) We should respond to all motor vehicle accidents in case we can assist.	84	43	3	10	7	147	57.1%	29.3%	2.0%	6.8%	4.8%	86.4%	11.6%
iii) We should respond to motor vehicle accidents only if an ambulance is going to be delayed.	4	12	10	29	88	143	2.8%	8.4%	7.0%	20.3%	61.5%	11.2%	81.8%
iv) We should attend motor vehicle incidents to provide safety blocking for other emergency services and provide roadway cleanup.	59	45	13	16	14	147	40.1%	30.6%	8.8%	10.9%	9.5%	70.7%	20.4%
v) We should not respond to any motor vehicle incidents.	1	0	2	6	135	144	0.7%	0.0%	1.4%	4.2%	93.8%	100.0%	97.9%
i) The current compensation is adequate in our department.	19	36	45	20	25	145	13.1%	24.8%	31.0%	13.8%	17.2%	37.9%	31.0%
ii) Volunteer Compensation should be the same across Leeds and Grenville.	52	38	38	12	6	146	35.6%	26.0%	26.0%	8.2%	4.1%	61.6%	12.3%
iii) There are no incidents of disrespect or bullying in our department.	55	31	23	25	14	148	37.2%	20.9%	15.5%	16.9%	9.5%	58.1%	26.4%
iv) Everyone is welcomed in our department; cliques do not exist.	41	37	20	28	21	147	27.9%	25.2%	13.6%	19.0%	14.3%	53.1%	33.3%
v) There are an adequate number of active volunteers at the station from which I work.	32	50	24	28	11	145	22.1%	34.5%	16.6%	19.3%	7.6%	56.6%	26.9%
i) There are an adequate number of officers in the fire department.	72	52	12	8	2	146	49.3%	35.6%	8.2%	5.5%	1.4%	84.9%	6.8%
ii) An adequate number of officers respond to emergencies.	56	58	13	15	3	145	38.6%	40.0%	9.0%	10.3%	2.1%	78.6%	12.4%
i) An adequate number of firefighters assemble at fire incidents within 10 minutes of first truck arrival.	36	68	20	19	2	145	24.8%	46.9%	13.8%	13.1%	1.4%	71.7%	14.5%
i) I have confidence in the leadership of our organization.	85	37	12	8	6	148	57.4%	25.0%	8.1%	5.4%	4.1%	82.4%	9.5%

Question or Statement to be Rated	Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree	Number Responding	Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree	Strongly or somewhat agree	Strongly or somewhat disagree
ii) Our senior officers are too busy and don't have time to pay attention to staff.	0	11	14	44	76	145	0.0%	7.6%	9.7%	30.3%	52.4%	7.6%	82.8%
iii) Municipal council is clearly aware of what we do and our value.	37	37	30	24	16	144	25.7%	25.7%	20.8%	16.7%	11.1%	51.4%	27.8%
iv) The public is clearly aware of what we do and our value.	43	44	26	28	5	146	29.5%	30.1%	17.8%	19.2%	3.4%	59.6%	22.6%
i) Adequate efforts are being put into public education and prevention.	36	59	28	16	8	147	24.5%	40.1%	19.0%	10.9%	5.4%	64.6%	16.3%
ii) Education and prevention should be provided by full-time staff on a county-wide basis.	30	48	31	21	16	146	20.5%	32.9%	21.2%	14.4%	11.0%	53.4%	25.3%
iii) I would be willing to commit an average of two to three hours a month to public education and prevention.	46	42	33	18	7	146	31.5%	28.8%	22.6%	12.3%	4.8%	60.3%	17.1%
iv) I would be willing to commit an average of two to three hours a month to fire mitigation and safety training for the public (e.g., use of fire extinguishers, safety in the home or farm, first aid, promoting AEDs, other awareness training).	49	43	31	15	8	146	33.6%	29.5%	21.2%	10.3%	5.5%	63.0%	15.8%
v) Fire departments should change the name to [Municipality] Safety, Prevention, and Fire Service to reflect a more proactive role to community safety.	6	8	45	18	68	145	4.1%	5.5%	31.0%	12.4%	46.9%	9.7%	59.3%
11. Fire departments should make greater use of technology.	48	47	40	6	4	145	33.1%	32.4%	27.6%	4.1%	2.8%	65.5%	6.9%

Training Hours	There are too many training hours	The number of training hours are adequate	There are too few training hours	Number Responding	There are too many training hours	The number of training hours are adequate	There are too few training hours
	3	126	18	147	2.0%	85.7%	12.2%

Training Type	There are too many hours allocated to some types of training	The number of training hours are adequately distributed based on the types of incidents to which we respond	There are too few hours allocated to some types of training	Number Responding	There are too many hours allocated to some types of training	The number of training hours are adequately distributed based on the types of incidents to which we respond	There are too few hours allocated to some types of training
	8	64	22	94	8.5%	68.1%	23.4%

Training Process	All staff receive equal opportunity to participate in training	Training opportunities are not made equally available to staff	Number Responding	All staff receive equal opportunity to participate in training	Training opportunities are not made equally available to staff
	134	14	148	90.5%	9.5%

Training Confidence	I feel that the training received prepares me for the types of incidents to which we respond	I don't feel that the training received prepares me for the types of incidents to which we respond	Number Responding	I feel that the training received prepares me for the types of incidents to which we respond	I don't feel that the training received prepares me for the types of incidents to which we respond
	123	15	138	89.1%	10.9%

10. I joined the fire department because (be honest, no one knows who you are).
I want to help people in my local community and want to help protect the loss of property.
At the time thought i wanted to be a full time firefighter and this was a good stepping stone.
To help and protect the people of our township and to give back to the township. And I love what I do as a firefighter/first responder
Being a firefighter was a dream since I was a young child. I love being a part of the department not only to help people in my community but it allows us to have a sense of purpose outside of work and social circles. Being a Volunteer sometimes doesn't have the reputation as a full-time firefighter but in a lot of ways I believe it is more challenging. You can't leave the job at at work and separate it with your other parts of life due to the fact that pager can go off at any time. When this happens everything else gets pushed to the side and it's time to go help.
- to carry on the torch, my family has been in the fire service for centuries. - to give back to my community - FIREFIGHTING ROCKS.
I was looking to use it as a stepping stone to full time employment as a fire fighter
I had the opportunity to watch the impact my father had in our community as a member of the fire service and am proud to have the opportunity to work along side him.
Nil
I grew up around the fire department with my father and other friends involved. I wanted to help out the public.
To assist my neighbors, friends and family. I always wanted to be a firefighter
To help people. To find a family. To make friends. To be part of a team. To feel like I accomplished something/helped someone.
I want to give back to my community and get to know my fellow residents better.
There was a clear need.
I wished to help my community in an extraordinary way. Action for the greater good.
To help others
My father was a volunteer firefighter in my hometown. I was new in town and I thought it would be a good way to get to know people
I wanted to help out my community and putting my life out there for others
I want to become a career firefighter and being a volunteer firefighter is a great way to begin that process. Firefighting to me is more than fighting a fire, it is being there for someone on their worst day and hoping to do some good without needing to be asked "can you help me".
I wanted to help my community, and learn valuable life saving skills to be a more confident person, worker, father, neighbor
To help in my community.
I wanted to be able to serve my community using my medical skills and help the department hone their own first aid skills to better help on medical calls.
I wanted to help my community , but time required is challenging to your whole environment.
I want to be able to do more in my community for my community!
I join the fire department because I wanted to help, protect and serve my community. I come from a long line of volunteer firefighters.

I love helping people. I love the comradery of my brothers and sisters in the fire service. I enjoy the challenges I am met with doing this. I like to learn and push myself.
A volunteer firefighter once saved someone very close to me. The feelings that firefighter gave me...I want to do that for anyone who may need it.
I grew up across the street from a fire department and I got to help clean trucks and equipment, from then on I knew I wanted to be a firefighter.
I am human garbage. I serve to redeem myself.
To help the community I enjoy being around and would love to help
Because it's something ive wanted to do since I was a kid it's a dream come true to be available to do it and help out anyway I can and help my community.
I joined so i could give back to the community that i live in and be there for people when they are having the worst day of there lifes, or help someone who is in need.
To serve the community
I have always wanted to be a firefighter and to help my community and help families in need.
I joined as a way to give back to community that I live. Never thought I'd do it. Was approached by another member a number of times before I committed. It was the best thing I have ever done. Being able to help my fellow residence is a huge part of why I do it
I like to think we make a difference in the lives of those we respond to. No matter what the incident
I have always wanted to be a firefighter and this was an opportunity for that to become a realty and also to give back to the township and also to help my friends and families in the area.
I wanted to give back to the community. My brother joined last year and told me about the amazing experience he has had so far, which enticed me to try it out.
I want to help out my home town when they needed me and I come from a long line of fire fighters
Help my community and to give back to the community
To help people and give back to the community. It's also a part of my heritage, I'm a third generation firefighter and very proud of that
To help out in the community
I went to school to be a full time fire fighter. My career now and the volunteer department fulfills my wants to be a fire fighter
I live in close proximity to the department, I intend on living here permanently or for a long period of time, I enjoy helping my community, and I wanted to broaden my skills/knowledge in the fire service.
To assist and serve my community
To serve and give back to my community.
i wanted to help people, have a brotherhood and its fun
To help others who need it. Have had family in need and helped by a firefighter want to continue to pay it forward. Take great pride in the position and responsibilities that accompany it.
I felt that I could offer something of value to the Community, the Department and to my fellow Firefighters
Exciting!
I like to give back to my community.
I wanted to help my community, use my medical training from school seeing its not what my full time job is.
i wanted to help our community
I enjoy the people I volunteer with and like helping my community
To make a positive difference in my community
To serve my community. Learned to like firefighting in the Navy been a volunteer for 40 plus years
As a young child was always a dream. until i did my co-op as a student and found so much down time that almost turned me off firefighting all together. Currently on a volunteer department on a call basis. no down time lots of training available and I can have a career and enjoy life outside the fire hall.
I wanted to give back to my community and had some previous fire fighting experience from other jobs.
I was on an industrial fire crew, and want more training, experience, and be able to volunteer in my community. It gave me skills, I got my DZ license and enjoyed the value that the community has in our department. Helping others in need is a good feeling. It's been a tough 20+ years but it's been fulfilling.
Over the years though I have seen the dedication of our firefighters drop. Not sure if it's the hiring process or just a sign of the times, but too many of our members treat the department too much like a volunteer position. Training attendance is sometimes poor, as is number of firefighters responding to calls. More discipline needs to be passed down from the top to ensure attendance is adequate for proper training, and morale at the hall. It seems it's so hard to get and retain good volunteers that we are afraid to let lower performing firefighters go, and the cycle continues. Sometimes we hire everyone thinking we will loose a few anyway, and pay less attention to the quality of the applicant.

I have always wanted to be a firefighter, and this was an opportunity to join a department serve my community and do things not many people do.
I joined because it brings that family of brothers and sisters back to me from when i was actively servicing in the armed forces. It also gives me me some of that same structure of the forces.
To help my neighbours
I wanted to serve our community.
Serve the community
To help the public and educate them with fire safety. join a brother hood.
To contribute the best way I can to my community.
Provide a service back to my community
My house burnt down in 98 and i saw the firefighters out there in the cold and decided at that moment that i will give back to the community the same way that they did. The best thing i ever did.
Had a lot of free time
I always dreamed of it and I wanted to help And let's face it... it's pretty bad ass
To give back to the community of that I live in and join a team of professionals that work well together.
I joined the fire department to get more involved in my community. I thought it would be an interesting and challenging thing to do.
Give back to my community
I wanted to give back to the community, and help In a way that I could
It strengthens my interest and solidifies my commitment to my community.
My Grandfather was a fire fighter on the same department, and before he passed he wanted to see me join the department, unfortunately he was not able to see this accomplishment, so for me its the pride of carrying on in my grandfathers steps. I also work in public safety, and this line of volunteering comes natural to me (first response, protect the public, emergency response, prevent loss, serve with pride, and give back to the community in which I have lived in my entire life).
I have deep roots in this community and I have been a lifelong resident. This community has always been good about helping their neighbours in times of distress. I have been the recipient of such support and decided to reciprocate if I had the chance. At the time, I knew everybody on the fire dept. and had a fair idea of what was involved. When the circumstances in my life were right - I had the time to devote to it and was financially stable enough to be able to miss work and absorb other assorted expenses - I applied to join. I did not join to use it as a stepping stone to employment at a full time dept. nor was I seeking the adrenaline rush of driving a truck, wearing a fancy uniform or climbing the organizational chain of command. I liked the idea of being able to help someone in the community if I could. When we get a call in our response area - no matter the circumstance - somebody is having a very bad day and if there is anything I can do to mitigate whatever the situation might be I feel a sense of accomplishment. I identify as being a VOLUNTEER firefighter. I resent anybody implying that I am a semi-professional or part-time professional firefighter or any other description to describe the position. I joined as a Volunteer, I remain a Volunteer and I am proud of it.
It's an opportunity to give back to the community
I join the fire department to be part of a community That protect one another I enjoy helping others in situations of trouble becoming a volunteer fire fighter has open my eyes how much people need The fire department and first responders
I have a passion to help people, and i enjoy the teamwork and atmosphere around the fire service.
I joined the fire department to give back to my community. I have a scientific medical background and after witnessing the great work that the Athens Fireman did when my father-in-law needed, I decided it was time to help others too. Since my admission as AFD firefighter, I have been trained and inspired by all my team in ALL activities - including fire structures, RIT, auto extrication, ice-rescue, community activities, etc. I have a passion for all activities.
As a woman, I feel honoured to be part of a Fire Department that is inclusive, encouraging, friendly, and very keen to give their best as volunteer firefighters.
I was at a really bad truck accident and felt helpless I wanted to help but didn't know really what to do So I joined so if that we're to ever happen again I would be able to make a difference
As well I enjoy volunteering and helping out my community however I can do I thought this would be my best route and I wasn't wrong
I've always been interested in being a firefighter, i I wanted to expand my knowledge, and push my personal boundaries
To help others

I joined the fire department because I wanted to work with a dedicated team oriented group of individuals. I wanted to contribute in a meaningful way to my community and I also wanted the challenge of learning new skills and improving my own abilities.
I volunteered to be able to assist my community in a meaningful manner. I believe that I possess skill sets and knowledge that allow me to be an asset to the department. I also very much enjoy learning new skills and testing my physical limits.
I enjoy being involved within my community and really enjoy the people within my department
I wanted something different in my life. Something new something exciting .
I wanted to give back to my community
I wanted to help my community
I wanted to serve my community and feel my science of pride and use the skills I have.
I wanted to help out in my community.
Several members of my wife's family are firefighters with many positive experiences to show for it, so I decided to join my local department to see what it's all about and what I could offer.
I felt I could make a difference in my community, and have always had respect for first-responders and the jobs they do, therefore I wanted to challenge myself in order to be an integral part of my communities safety.
I joined to give back to my community.
To give back to my community and it has always been something I wanted to do.
I wanted to give back to my community, have been interested in firefighting for years.
I have always wanted to help people. I want to be able to be there for people in there time of need, to help them and to make them feel safe.
I wanted to help my community
The adrenalin rush that comes with the job and knowing that my actions, no matter how big or small, are aiding the community in some capacity. Being able to aid those in need with no desire for compensation from the victims feels very rewarding and fulfilling.
i wanted to make a difference in my community and I have a lot of family history/ties to the fire service
I joined the fire department because I love my community.
To help and serve people. To help protect property and the environment. To have unique and challenging experiences.
I see it as my responsibility to give back to a community that has given my son and me a good home for almost 20 years.
I wanted to help my community and use valuable skills i have to do that.
To help better serve my community.
When I first joined, I wanted to be a full time firefighter. After many changes in my work life, I've decided not to apply to a full time position as a firefighter. I enjoy the learning and group that I meet with Several times a month at our volunteer fire service. Our leadership is over the top and our training is thoughtful to our occurrences that we respond to as the pager goes off.
I had just moved in to the area from Toronto and I wanted to get involved in my community.
I wanted to help our community and the people in it. I have a strong will to help people in need and to help someone through a situation makes me proud toward my community.
To help
Got to know the community as I was new. Also offer additional community services based on my experience from past fire department training. Build some camaraderie within the community. Learn to be more of a team player within my community as an entrepreneur in the area.
I joined the department to help people and give back to my community. I also think this survey is poorly put together.
Because i wanted to help my community and i thought it was something id enjoy doing
Great group of guys. always had interest in becoming a fire fighter. Help out our community. Have medical background, thought it would play well with the fire company.
to give back to a community that has given so much to me and provide protection to the houses and businesses that are in the township. Also to be there when people are in need
Oppurtunity to give back to my community. Challenging and exciting
Have always had an interest in Fires Services and when I moved, I wanted to find a way to help in my municipality and become apart of it.
To help someone in need.
I wanted to help in my community.
I wanted to make a positive difference and help people.

Neighbor's barn burnt down and I was put off scene from helping by fire department due to liability issues. So I joined to help my community
Want to help our community and teach our youngsters that a volunteer work has great benefits
It interested me since I was a child
I wanted to contribute to the community and help others. I felt i needed a purpose in life and joining the fire service has really made me feel like i have that purpose now. Couldnt be happier being a volunteer firefighter.
For the training and brotherhood also helping those in need
I joined the fire department to help my community.
I joined so I could be of help in the community. Every community needs volunteers.
I wanted to serve my community and gain experience in emergency services. I have a strong interest and passion for firefighting.
I wanted to join an organization to assist the public.
To meet like minded people and to provide an exciting and rewarding service to the community, while gaining experience and training for a full-time firefighters job.
It was something I had always wanted to do
to make a difference serve the community
Because i wanted to give back to my community
I wanted to be a firefighter since I was a kid .
I am very proud to work for the Fire Department. At the end of the day I feel like I did my best to help somebody in need. It's a very rewarding job.

11. Comments from: Fire departments should make greater use of technology. Please give examples.

GPS in trucks
Using a precision incident location app such as What3words to pinpoint incident scenes whenever possible.
drones and who's responding and Incident command tablets..
In my department, I feel we are constantly looking for new things that will improve our service and efficiency. That being said when I go visit other departments in the area there are some things I take back for us to do or look at, but more times than not I feel lucky that we have improved what others feel like is already a best practice.
- drone division
- electronic accountability systems
Paperless forms
Tablets in vehicles
Centralized software ex. Firehouse
Online training is useful and can be more in depth and instructional to what local departments can provide.
Who's responding app is not used by all firefighters but could possibly be interconnected with pagers.
Better use of IPADS for multiple things, drones, compressed air foam
More tablets to reduce paper sign off for Training and additional sign offs
Tablets
Social media
TIC in the face pieces
I think we use far more tech then years ago and stay up n new ideas
I cannot speak for other departments but I believe that departments should be able to provide the same service to their communities, regardless of boundaries. I also believe that firefighters should have outdated, insufficient equipment or a lack of proper equipment while the department a township over has brand new equipment. It becomes an issue that prevents the job from being done correctly and sometimes becomes a safety issue. If every department can't have the same equipment due to budget, then the department called for mutual aid should have that piece of equipment so every community can benefit from it. Training should be given to neighbouring departments.

I would also suggest a county wide medical training program to be run by UCLG Paramedic Service if medical calls continue to be responded to by fire departments. Medical training is hugely under appreciated at mt department. All firefighters that respond to medicals should be given at minimum, a 40 hour first responder course. This should be managed by UCLG-PS and training should be run, at least, every six months. Every department should also be provided with some training on the equipment the paramedics use to be able to assist them better. This program, being the same throughout the county, enables a greater trust when paramedics work with local departments and leaves no worry about what standard of care the patient will receive. Paramedics assist the patient, firefighters assist the paramedics and that's how everyone will be safer.

I'd suggest medical equipment and although I cannot speak for other departments I know the gear you're given in one township is very different the neighboring township when given medical equipment.

Ideally it should be the same as EMS to allow greater interoperability. AED pads for example should be able to plugin to the cardiac monitor that the paramedics use.

Breathing apparatus should be the same county wide to allow better interoperability. Truck set ups should be similar where possible.

More radios as my department doesn't have enough for every person on scene.

Numerous pieces of extrication or technical rescue equipment.

Technology changes and so do the courses so in service training should become more common.

A county wide rehab unit would be a benefit to all firefighters on calls that have a longer on scene time. A few larger departments have one staffed by volunteers that are separate from the fire department. They provide food, water and shelter for firefighters working in extreme conditions. In the summer it would have A/C and heat for the winter months. Presently EMS handles basic rehab on most major scenes I've been on however they aren't always available should something arise and definitely don't provide food on scenes that sometimes take a few hours to clear from.

The technology and education has advanced but I feel as of many departments have not. However, technology means nothing if it's not used to it's full potential. The easiest way to do that is by giving proper training and taking advantage of expensive equipment by sharing with neighboring townships.

I apologize for the novel and hope this has provided some insight.

Tablets in our trucks that are tied into our app for updates on the way to the call and GPS in the tablet.

Also tablets for our call/time sheets, cut down on the paper used and uploaded the info directly to the system.

Technology is nice to use but it fails all the time and makes things harder for us but also technology helps us in many ways like a tic helps us see hot spots we can't. radio helps us stay in communication with firefighters operations inside and out to keep our members safe on scene.

Drones - to see around the area for grass /brush fires

Laptops in trucks- to use for updates on way to calls or to use at a call for info , or making reports easier

Med calls .

Drones, on-line training, 3rd party training

GPS in all trucks to give exact location of call and roads to take for better response time by the fire service.

Cad systems in all trucks. Better personnel accountability systems. Better PPE for the fire fighters by

drones

GPS units for wildland fires

I feel that the amount of technology that is used in the day to day is sufficient.

Tablets GPS

Any and all new technology that would greatly benefit us and potentially save property/ life.

Drones (good for search and rescue, hazmat vehicle calls on 401, train derailments, large scale grass / forest fires etc.), newer and updated equipment for volunteer departments, electric jaws of life and other extrication tools, Battery positive and negative pressure fans instead of gas that emit CO and blows into the house where firefighters or occupants of the building may be.

Log hours digitally - online portal, or app based

Access to training materials, and a log of all training completed should be filed digitally, and accessible to the member at any point

Training "Matrix" should be developed to summarize which firefighters are signed off on what skills/equipment

Training opportunities outside of regular training should be made available or offered to all members and not just senior members or officers. Anyone eligible or that has the adequate pre-requisite training courses should be given an opportunity to attend.

HOWEVER - DO NOT PUSH FOR STRICTLY WEB BASED TRAINING - IT IS NOT EFFECTIVE, hands on and in person is best for core skills to be learned and developed. Web based training should only be used to supplement.

Drones , computers , technology based programs to assist calls and responses , and accountability within the membership.

Records management Mandatory digital Exposure reports - what we breath in, what we see, Mandatory remote counselling semi annual - just to ensure each firefighter is ok in all aspects and fit for duty. This would also help end the stigma of PTSD if everyone was forced to talk privately. iPads and GPS & dash cams in every truck County drone team should be established Technology for increased department announcements and communication tracking. We have a huge break down in communication within the department which creates huge conflict. Example: A tool is moved from truck to truck, the only people who know about it are the people who attend training that night. Example: our officers all interpret things like wearing a mask differently - the firefighters get in trouble because one officer says take it off, then 10 min later the next officer says put it on and the cycle repeats. This applies to many topics Increased communication with tracking of who read and understood each department update is something that needs to change
gps, dash cams in trucks, drones, online training
Live training simulators, Virtual Training programs, random mandatory online tests / links to quizzes, organized training log/database for each members current qualifications.
On-Board computers ie: site planning, road network, on-scene hazards, WHMIS info, Chemical Safety info, etc
Computerized accountability!
Drones, gps in vehicles, online training available
Digital forms Tablets in apparatus Centralized reporting software
Apps - electronics - simulators on line training
Proven technoligies I agree should be used.
Gear upgrades can benefit the departments and health and safety of its member. Our department was early to adopt Carbon Fiber SCBA cylinders, thermal imaging cameras, gas meters etc. and we enjoy the support of our council. Any time we can take advantage of new equipment our chief and council will consider, doesn't always happen. I know that we have to justify the spend versus the probability of needing the technology, but some large spends such as SCBA upgrades may loose out to other things. There should be a scheduled effort to replace critical, expensive parts of our PPE, like a fire apparatus gets.
using drones, better medical gear for treating patience, trying new products for firefighting. Utilizing tablets like iPad to preform maintenance, and using them on scene.
Drones, Phones (apps),
Smaller thermal imaging cameras, battery powered fans so you are not looking for a fuel source and can be more mobile, stronger portable lighter lighting etc.
Counties/townships should provide more funding so all departments can work with the same stuff that is all up to date and somewhat iso across the board so we can work with other departments as needed. And to provide the best service we can to the public.
I believe we do take advantage of technology
Heat sensing drone? Ariel shots etc.
Drones could be used in remote situations under and training on new improved methods available to keep up to current techniques.
I do not have an answer at this time, as we use a fairly reliable paging system, and an online training system, which is then followed up by practical portions on training nights. I have heard feedback, and I think if more technology was added it would discourage members than encourage, as not all persons are tech savvy.
there are obviously benefits in taking advantage of any technological advances which expedite or otherwise enhance any task - however I find some of these things are gadgets which some snake oil salesman convinced our leadership that we couldn't live without but usually wind up being not used and forgotten - not very cost effective. A few other examples: - the road grid in our municipality is not very complicated - emphasis should be made on the importance of familiarity of the road map of our response area - personnel should be discouraged from relying on GPS directions to a call requiring immediate assistance. - Who's Responding App. - great tool if everyone is using it - in a rural volunteer dept. which could be dealing with a limited personnel response at any given time - when the pager goes off the firefighters time might be better spent retrieving equipment to go to the scene or responding to the scene to assist and size up the situation according to whatever the normal response procedure is as opposed to trying to determine who may or may not be coming and when they might get there

- digital communication equipment/pagers tend to be very light on updates after the initial page goes out - with the old analog system you could pick up radio chatter between dispatch and other equipment, allied personnel response and changes to the situation
GPS is an all the trucks
Drone technology
Online training/learning
Apps (whos responding) (gps tracking for search and rescue)
Technologies that, in my opinion, need to improve to protect firefighters and better our response efficiency.
1) pager system - currently we are using the app, and the older pager system;
2) GPS in the trucks. Many volunteers they now reside in Athens are not originally from the area. Having GPS in the truck (a system connected to the dispatch) would greatly improve the response time;
3) We urgently need help with our trucks and ambulance. They are old, and even with our daily inspection, they have failed to function when we needed in the past.
More up to date procedures
Better tech to improve communications.
Computer aided dispatch in trucks that would include maps (GPS), site surveys, hazardous material information etc.
I could go on about drones, updated thermal imaging cameras etc. the wish list would be long. There is all sorts of new tried and tested technology available that would assist in making the delivery of service more efficient and have a positive impact on fire fighter safety.
GPS in trucks.
Scab Masks all equipped with thermal imaging could greatly increase finding ejected occupants from vehicles at scenes as well as hotspots and hazards while working at fire scenes and possible other hazardous exposures. The fact that all volunteer masks do not have this equipped by now and it has been out for six or seven years is crazy when a lot of our Province runs off volunteer departments who for the most part volunteer their lives to helping everybody else.
Yes, as long as the new technology doesn't significantly increase the amount of specialized training required for personnel or require more rigorous maintenance schedules.
GPS nav in all trucks with automatic location of incidents when calls come in to the station.
GPS location and direction to scenes
Tracking of FF on scene
Heads up display masks
I would like to see mapping more easily accessed and more preplanning in crisis system that could be accessed on first responding trucks
Our radios and pagers terrible.
Up to date equipment, tools that do not require as much physical stress on the user to aid in preventing early fatigue. Lighter packs, exercise equipment for body building/training.
up date and make thermal imagers readily available and upgrade scba's and scba's filling stations making all of the packs the same brand and same tanks to allow interchanging at scenes and mutual aid calls easier
upgrading are pager and radio system there are many spots in the county that they do not work or that the transmission is broken or you can not understand what is said
Communications technology to stay up to speed particularly with mutual aid members and training exchanges. Radios today are simply too hard to hear when inside a building let alone it catching on items in tight confinement spaces. This can be integrated in the mask and possible cellular or other communications mediums can be used in place of frequency radios for more clarity..
Integrated thermal vision would assist firefighters to understand situation of fire (ei: Thermal layers), find warm areas like potential persons/animals compromised in a building, fields, vehicles, and ditches and transferred info in real time to incident command for quicker and better decisions made on the ground.... By incorporating cameras in the mask, this will help firefighters carry more breaching tools needed for the operations or simply carry other items needed for the task.
Electronic accountability system to have a real time view of an incident.
Lighter, more nimble, more protective PPE for both interior operations and wildland operations. This includes specific boots, gloves, next to skin protection, and helmets for the task. This will improve the performance of the firefighter and also reduce the chances of over heating during rigorous operations. In addition strict use of station wear would be used more frequently if the gear were more safe & comfortable offering the department more pride and increased moral.
Trucks should have 2 speedlays minimum for initial attack and concentrate on quick defensive maneuvers over placing firefighters at risk in today's toxic construction standards.
Driver training for all firefighters should be a must in defensive driving measures and positioning of vehicle for safest operations. While this does not present itself as viable with the minimal apparatus at hand and what needs to "Stay" in service, we should be going over common scenarios using technical software specific to our land layout, and possibly bring in a mobile simulator twice a year so we can learn. this should also be practiced with

<p>other first responders (often showing up at the scene) twice a year such as Paramedics, Police, and even tow drivers responsible for mop up. There needs to be at least one mock scenario per year with all first responders for potential mass scale disasters such as tornadoes, ice storms, etc. Mutual aid department to understand unified command for various responses. This can also include OFM, Red Cross, other ESS volunteer organizations (food temporary lodging), and perhaps veterinarian involvement for pet evacuation understanding and preparedness.</p>
<p>iPads for on scene photos and visual imagery for training purposes especially new recruits. What real life scenes look like.</p>
<p>computerized equipment tracking better use of whos responding digital maps in the trucks for faster responses computers programs to help officers in doing their jobs to the level the membership requires</p>
<p>GPS's auto down loading on all calls in all emergency vehicles.</p>
<p>Navigation in response vehicles Drones</p>
<p>GPS in trucks.</p>
<p>GPS in trucks. TV for whose responding.</p>
<p>There is more technology out there that could s save the lives of our members and public but the financial costs can't be reached by smaller municipalities.</p>
<p>More battery powered tools for various tasks Computer in trucks that provde info on where a call is, details, aproximate coordinates that the passenger can relay to other firefighters on the way to a call so they can better prepare themselves for thst specific call.</p>
<p>The biggest problem of using the latest technology is the cost. some Municipalities don't understand the need and the importance of the Fire Service and the need of the latest technology in order to serve the community better and to protect ourselves on scene.</p>
<ul style="list-style-type: none">- Upgrading to the Latest Equipment, training and fire suppression as they become available. In order to achieve the best results for our communities and have the highest safety standards.- New apparatus, SCBAs, tools, medical equipment ect.
<p>I fought for 5 years to switch t battery powered extrication tools before we finally purchased a set. within two years its all we have. I fought for a new advance helmet style, leadership wasn't interested in even trying them for comparison, saying, it's tradition and have had any problems.....it can always be better(I work in continuous improvement at a factory)</p>
<p>We could be making better use of social media to keep the public educated and informed.</p>

12. Appendix G Fire Chiefs' Survey Results

We also surveyed fire chiefs to understand their thoughts and approach. Five of 12, or almost 42% responded. Their answers follow below.

Question or Statement	Chief 1	Chief 2	Chief 3	Chief 4	Chief 5
1. I would be willing to standardize equipment with other fire services as time for replacement or refurbishing occurs.	Neutral	Somewhat agree	Strongly agree	Somewhat disagree	Neutral
2. There are more advantages than disadvantages to standardizing equipment within county fire services.	Neutral	Neutral	Strongly agree	Somewhat agree	Somewhat disagree
3. Can you offer possible advantages of standardizing equipment?	There could be some small savings in fleet, but it would not be substantial savings as we simply do not order enough vehicles. Again there could be some savings in purchasing equipment, but similar to trucks we just do not have the numbers for substantial savings. There could be some advantages to working together for mutual aid, joint training and combined maintenance programs	possible cost savings, mutual aid, equipment familiarity.	Economies of scale when purchasing Planning and delivery of training Parts inventories Familiarity of equipment when crews attend an incident as part of a mutual aid call.	Uniformity Possible cost savings in purchasing from supplier. Savings in engineering & design? perhaps, better equipped for departments that had to purchase bare bones due to budget.	possible costs savings, compatibility with neighbouring departments
4. Can you offer possible disadvantages of standardizing equipment?	There will be a savings but not substantial. For example we are not Toronto or Ottawa that sign deals to provide 20 to 40 trucks per year. Pumpers have a life span determined by FUS, 15 years, and FUS is investigating having life spans for tankers and Rescues/ You would have to get all departments years lined up, Some would need to keep a truck longer than they should, risking increased insurance rates, and some would have to purchase trucks earlier than necessary, all in an effort to line up the years. And then the small amount you would save wouldn't be yearly but every 15 years. Each Department purchases equipment based on their needs and circumstances. Each Department is different and offers different services. Again, PPE has a 10 year life, in order to get some limited purchasing power your would need to line up the expiry years. Some would need to keep gear longer than what the standards state and	Each municipality has specific hazards that need to be addressed. There is no one size fits all fire apparatus. Different staffing levels may require specific equipment for effective operations.	Some people may feel a loss of control or feel they have less of a voice in choice of equipment, especially front line staff who may have been involved in selection previously.	Coming up with a model to suit everyone's needs & local circumstances.	Individual chief's may have had bad experience with equipment that they are told they must now use, different styles, colors

Question or Statement	Chief 1	Chief 2	Chief 3	Chief 4	Chief 5
	<p>some might have to but gear earlier than necessary. And again, for very little savings. Some think there is a great savings to be found with standardizing equipment, but I do not believe that to be the case. Although it would produce some limited savings, but the savings would not outweigh the costs of organizing this purchasing concept.</p>				
<p>5. I would be willing to participate in a multi-service centralized purchasing program (defined as all purchases over a certain value would be routed through a central process). The value could be based on purchasing limits for your municipality, or municipalities may be able to agree on a cut off amount of \$5,000, \$10,000, or other value above which purchasing would be done centrally in an effort to achieve cost savings based on greater quantities.</p>	Neutral	Somewhat agree	Strongly agree	Somewhat agree	Somewhat agree
<p>6. I would be willing to participate in a pool purchasing process through centralized standing offer agreement. Using helmets as an example a committee would decide on a standardized helmet (or two) and, when it came time to purchase helmets, they could be ordered rather than going to tender).</p>	Neutral	Somewhat agree	Strongly agree	Somewhat agree	Somewhat agree
<p>7. There are advantages to a centralized purchasing - standing offer arrangement.</p>	Neutral	Somewhat agree	Strongly agree	Somewhat agree	Somewhat agree
<p>8. Can you offer some expected advantages of a centralized purchasing - standing offer arrangement?</p>	Small Savings	possible cost savings.	Economies of scale when purchasing Planning and delivery of training	Stability of price for a set period of time. Designated supplier	No need to spend time on tenders especially for large ticket items like apparatus, possible costs savings, standardization

Question or Statement	Chief 1	Chief 2	Chief 3	Chief 4	Chief 5
			Parts inventories Familiarity of equipment when crews attend an incident as part of a mutual aid call.		
9. Can you explain possible disadvantages a centralized purchasing - standing offer arrangement?	Department having to change equipment that they are used to using, causing more training. Again, very little savings as leeds and grenville simply is not big enough	The lowest priced item is not always the best value. Most firefighting equipment will be in service for 10 years or more. Spending more up front for superior quality can pay off over the life of the product.	Some people may feel a loss of control or feel they have less of a voice in choice of equipment, especially front line staff who may have been involved in selection previously.	Lack of input into process. Possible customer service issues with supplier in past that needs to be brought forward.	depending on the arrangement no hidden costs associated with a centralized purchase system. i.e. township road signs can be purchased through the County but they add a 15% upcharge for co-ordinating this so where is the advantage?
10. Currently, when planning to purchase apparatus, bunker gear, or other assets I coordinate with other departments to purchase together in greater quantities.	Strongly agree	Somewhat agree	Neutral	Somewhat agree	Somewhat disagree
11. I have considered joining purchasing consortiums (examples may be Kingston, Ottawa, Cornwall).	Neutral	Neutral	Strongly agree	Somewhat disagree	Neutral
12. If you have considered joining purchasing consortiums but decided against it, please explain why.		I am unaware of these purchasing consortiums. Please provide info. Past efforts to "get in" on a large purchase being made in the area have not resulted in the same price as the primary purchaser.	Resistance from own municipal purchasing department.	Research time. Lack of contact information. Difference in needs due to geographic area and assessment.	
13. Please list the factors that would have to be in place for you to be willing to participate in a centralized purchasing - standing offer program?	Have a base model etc. and then be able to adjust as needed by each dept. Multiple choices for each item	The fire service must evaluate and approve all products that would be included in the program.	Range of items available through the program. Evaluations done on the equipment prior to selection by some front line staff (not necessarily from my	Input into product Input into supplier & past dealings & customer service. Option to add additional	Helmets, gloves, hose nozzels

Question or Statement	Chief 1	Chief 2	Chief 3	Chief 4	Chief 5
			department), so that it isnt just lowest price items that are identified for purchase, its items that will appropriately do the job.	features & design, according to needs & circumstances.	
14. I support the idea of a county fire facilitator - coordinator to assist with partnering, efficiency, and effectiveness initiatives.	Strongly disagree	Strongly disagree	Strongly agree	Somewhat agree	Somewhat disagree
15. A comprehensive data gathering strategy should be implemented for the purpose of a standard comparison of fire services within the UCLG.	Neutral	Strongly disagree	Strongly agree	Somewhat agree	Somewhat disagree
16. A comprehensive data gathering strategy should be implemented for the purpose of collecting outcome data to help decide the type of responses and services that should be provided by fire departments.	Neutral	Strongly disagree	Strongly agree	Somewhat agree	Somewhat disagree
17. A county data coordinator - facilitator position should be in place to ensure consistent, uniform data gathering compliance among fire departments?	Strongly disagree	Strongly disagree	Somewhat agree	Somewhat disagree	Somewhat disagree
i. Please list the education and prevention programs being provided in your municipality.	Request or Complaint Inspections, visit schools and children during Fire Prevention week, Pamphlets at locations throughout municipality. Visit with seniors groups throughout the Municipality, Walmart during FP week	Complaint and request inspections. Voluntary home safety inspection program. Smoke alarm program. TAPP C. Burn permit program.	<ul style="list-style-type: none"> • Learn not to burn (kids) • Remembering When (seniors) • TAPP-C (arson prevention) • What's Cooking for teens • Home Smoke Alarm Program • Seniors Smoke Alarm initiative • Fire Extinguisher Training • Sightline to Safety 	Mandated items in accordance with the FPPA. Farm Safety Summer Safety Fall Safety Attend public events providing fire & life safety literature Local Risk Assessment & needs and circumstances. Seniors, using concept of the Older & Wiser program Elementary schools.	public education, inspections upon request, Vulnerable occupancy inspections

Question or Statement	Chief 1	Chief 2	Chief 3	Chief 4	Chief 5
				Limited in the TAPP C (youth fire setter program) Fire Extinguisher Training for Scouts & Guides, some local industry. Baby Sitting fire safety in conjunction with other agencies	
ii. Why are the education and prevention programs listed in item i, above, used?	We have limited staff to provide anything further		<ul style="list-style-type: none"> • To educate and promote fire and life safety to various age demographics. • To try and mitigate dangerous fire behaviours in youth and teens. • To ensure that all home in Brockville have proper working smoke and CO alarms and help eliminate other hazards around the home. • To provide service to seniors by installing at no charge batteries in their smoke/co alarms. • To provide training on the proper use of fire extinguishers in the home and workplace. • To ensure that people who are hard of hearing have the appropriate working smoke and CO alarms to alert them 	Legislated Risk Assessment Requests Past fire loss stats.	
iii. What locations are visited for education programs?	Schools, senior groups	Schools, early years group, seniors group, various public events throughout the year, upon request.	<ul style="list-style-type: none"> • Schools • Retirement Homes and Building for Seniors • Private Residences • Workplaces 	Fire Stations, tours, education in training room Community Groups & settings Public venues / Community events Public Libraries Aside from education programs	Local school, ongoing local community events

Question or Statement	Chief 1	Chief 2	Chief 3	Chief 4	Chief 5
iv. How frequently are education programs provided to each location?	schools once per year, seniors 2 -3 times	annual or upon request.	Schools annually Retirement Homes and Buildings for seniors by request Private Residences intent is to get in every every home 5-8 years. Workplaces by request	we use the same venues for recruitment information. Some are seasonal (Fire Prevention Week) Summer / Fall Festivals, local flavor When scheduling on both parties permit.	Yearly or as requested or required
v. Are there education and prevention activities you would like to implement but have not been able? Please explain why.	Would like to do proactive inspections, but do not have the time / personnel. Would like to do a door to door smoke alarm check, but again do not have the time or personnel to accomplish	Limited staff time availability. Limited volunteer training in code enforcement. Limited volunteer staff during the daytime.	We're always looking at different programs to implement which best suits our needs and demographics.	Enhance Smoke / Carbon Monoxide door to door. Same for home inspections. Additional scheduled commercial & industrial inspections Staffing Training for staff to conduct inspections.	Would like to do more inspection but do not have the manpower
vi. Is a measurement method used to determine the impact or success of programs?	no	no, participant/public feedback only	Not at this time, other than tracking the overall number of fires.	Overall critic of program & delivery. Feedback of audience Numbers of attendance. Request for topics & return visits Stats on fire loss & cause. (ie: cooking accidents)	Nothing other than decrease in responses
vii. If you have answered Yes to item vi, above, please describe the method.				as above	