CAOFS20-002 Appendix B

CITY OF PETERBOROUGH

Fire Station 2 Location Review

June 2020 - 18-8071

Table of Contents

Tables

Figures

Appendices

1.0 Introduction

The purpose of this study is to evaluate options for the relocation of Peterborough Fire Services' (P.F.S.) Fire Station 2, one of three existing fire stations. To support the assessment of the Station 2 relocation, this analysis evaluates five potential Station 2 locations. Included in the assessment is consideration of a potential future fourth fire station. This is done to ensure that the selection of a site for a relocated Station 2 will not compromise the location of potential future Station 4. It also presents analysis that considers the fire suppression emergency response performance benchmarks of relocating Station 2 within the context of a three station model and the existing emergency response performance capabilities of the P.F.S. This analysis has been undertaken with consideration to the applicable legislation, industry guidelines and standards representing current industry best practices. It was also undertaken within the context of the future growth within the City of Peterborough (City).

Dillon Consulting Limited (Dillon) was retained to support City staff with confirming the analytic methodology, developing an evaluation process for the alternative site locations identified and conducting the comparative analysis. Dillon also provided support to City staff to inform the Geographic Information Systems (G.I.S.) model analysis completed by staff and provided input at strategic points in the analysis. Dillon developed the decision-making evaluation criteria in collaboration with the City, and undertook the evaluation of the alternative fire station location options. Information used to conduct this analysis was provided in consultation with City staff including the Geomatics/Mapping Division who led the G.I.S. analysis as well as P.F.S. senior management, Planning and Development Services, and the Transportation Division.

1.1 Existing Three Station Model

Peterborough Fire Services (P.F.S.) is a full-time department which provides fire protection services as guided by the City of Peterborough's Establishing and Regulating By-law No. 10-185. The department provides a range of services including fire prevention, dispatch, public education, training, hazardous materials response, water and ice rescue, high angle rescue, confined space rescue, and trench rescue. The department also provides protection to the Peterborough Municipal Airport and is a Level 2 Provincial response team for hazardous materials. P.F.S. deploys fire suppression staff resources from three fire stations located strategically throughout the community as shown in Figure 1:

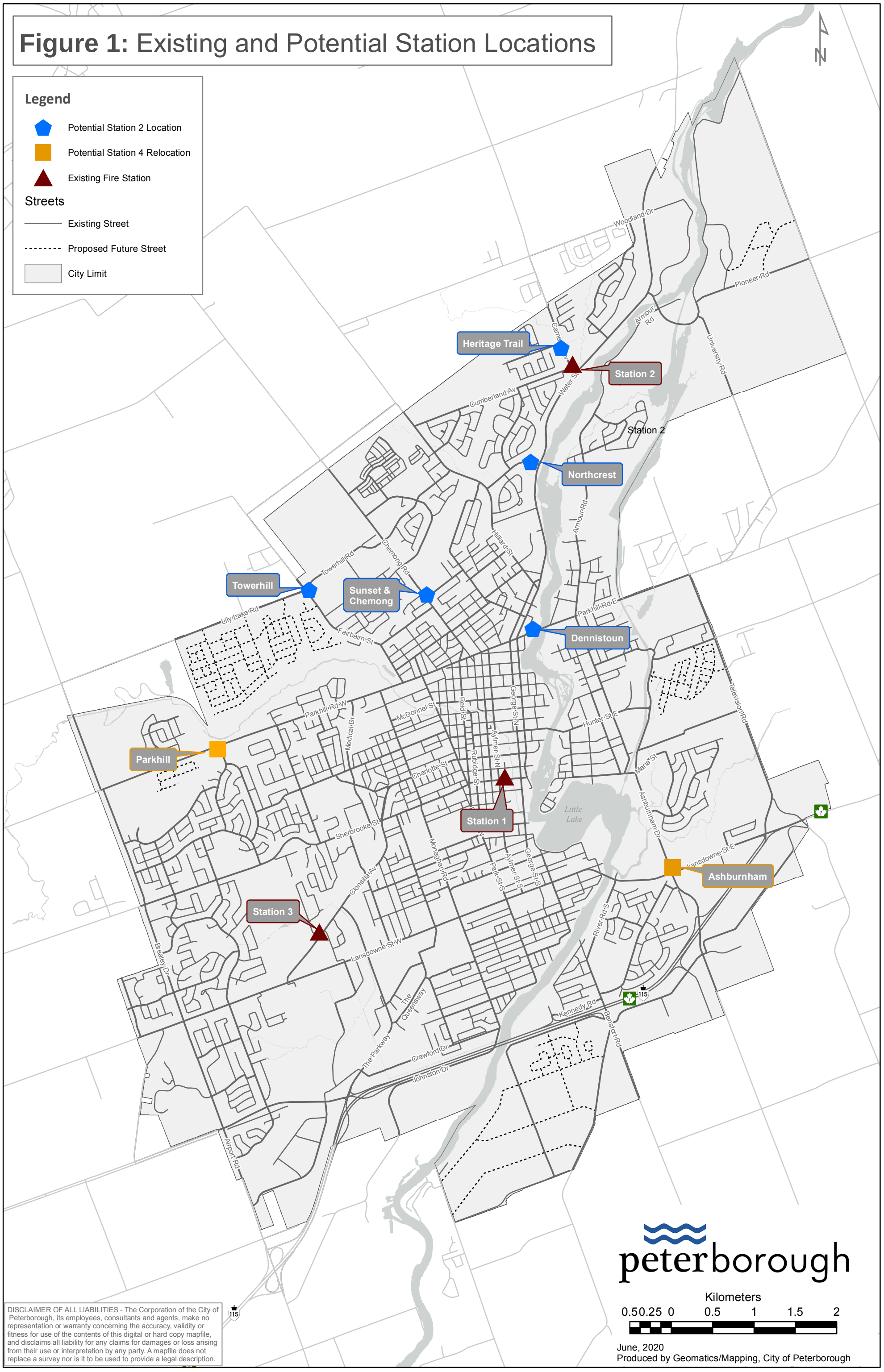
- Station 1 - 210 Sherbrooke Street;
- Station 2 - 161 Carnegie Avenue; and,
- Station 3 - 839 Clonsilla Avenue.

Table 1 illustrates the current allocation of firefighters by station and apparatus when P.F.S. is operating at the minimum staffing level per shift. To understand how the total number of suppression staff translates to the minimum staffing on a given shift it is important to understand two staffing elements. First, it is necessary for the P.F.S. to operate four shifts in order to have firefighters on duty 24 hours/day, 7 days/week and 365 days/year, so the total suppression staff complement of 80 firefighters is divided by four. Second, it takes 20 firefighters assigned to a shift to ensure that at least the minimum complement of firefighters are always available. These additional assigned firefighters are needed to accommodate vacation time, sick time or other necessary leaves. The P.F.S. current fire suppression deployment model includes a minimum of 15 firefighters on duty at all times. This includes a minimum of three firefighters and one captain on each first due apparatus (pumpers) at each of the three current fire stations. In addition, there is a Platoon Chief and a firefighter assigned to a Command vehicle, and one firefighter assigned to the aerial at Station 1.

Table 1: Existing Deployment Model – Minimum Staffing

Station	Apparatus	Minimum Staffing
1	Pumper	4
	Command	2
	Aerial	1
2	Pumper	4
3	Pumper	4
	# of Firefighters on Duty	15

Figure 1: Existing and Potential Station Locations



1.2 Existing Fire Station 2

In 2017, a status update regarding the replacement and location of Station 2 was initiated by P.F.S. which in part led to this Fire Station 2 Location Review study. Built in 1968, Station 2 has reached the end of its projected lifecycle. This fire station is also located within a water protection area (flood plain) and as such has been exposed to flooding within the station that resulted in challenges with mold control (since addressed). The design structure of the existing station is also not consistent with current industry standards. For example, the station does not meet accessibility requirement per the Accessibility for Ontarians with Disabilities Act and its size requires that suppression apparatus be parked at an angle to fit into the space. The station also does not have drive-through apparatus bays for safer and efficient operations.

The evaluation of the Fire Station 2 relocation options included a review of five different Station 2 locations identified by the City. The five Station 2 options are illustrated in Figure 1 and are located at:

1. Dennistoun - Dennistoun Avenue / Parkhill Road;
2. Northcrest - 100 Marina Boulevard;
3. Towerhill – Towerhill Road/Fairbairn Street;
4. Sunset - 916 Chemong Road, and,
5. Heritage - 425 Heritage Trail.

1.3 Potential Fourth Fire Station

The objective of this study is to identify potential Station 2 sites that will work well to improve existing response coverage in a three station model and that will allow the evolution of the P.F.S. to a four station model. The potential addition of a fourth fire station to provide fire suppression services to the City of Peterborough was identified within a February 16, 2010 report to the Committee of the Whole. This report identified that a fourth station in the East City may be required in response to anticipated growth. For over five years, funding has been allocated in the City's capital budget for the addition of a fourth station recognizing this potential need. The addition of a fourth station was also identified within the 2019 City-Wide Development Charges Background Study.

In the time since the 2010 report to the Committee of the Whole, growth expectations have changed within the City. We see proposed development in both the east and west parts of the City. In order to not pre-judge the location of a potential fourth station, potential station locations were included in the analysis on the east and the west side of the Otonabee River. This study is not a robust assessment of possible Station 4 locations, so two generalized locations were selected to be representative of possible future Station 4 locations. Consideration of a four station model also allows for analysis of the impact of adding a fourth station on the fire suppression emergency response performance capabilities as compared to a three station model.

The City identified a location on the east side of the Otonabee River to be representative of site locations here. Some alternative generalized site locations were also tested prior to selecting the chosen representative location. The City also identified a location on the west side of the Otonabee River to help serve growth and development. In a similar manner to the east side site, alternative generalized sites locations were tested prior to selecting the chosen representative location.

For the purposes of this study, the two Station 4 options considered are illustrated in Figure 1 and are represented by a location at:

1. the intersection of Ashburnham Drive/Lansdowne Street East; and,
2. the intersection of Parkhill Road West/Ravenwood Drive.

The remaining sections of this report present the methodology, evaluation process, and findings:

- Section 2.0: Applicable Legislation, Industry Guideline, and Standards;
- Section 3.0: Methodology;
- Section 4.0: Station Location Analysis; and,
- Section 5.0: Conclusion and Next Steps.

2.0 Applicable Legislation, Industry Guidelines, and Standards

This study was conducted in consideration of the applicable legislation including the Fire Protection and Prevention Act, 1997 (F.P.P.A.), the Occupational Health and Safety Act, R.S.O. 1990 (O.H.S.A.), industry guidelines as authored by the Office of the Fire Marshal and Emergency Management (O.F.M.E.M.), industry standards as authored by the National Fire Protection Association (N.F.P.A.) and Dillon's knowledge of current industry best practices as garnered from our experience in working with other municipalities in Ontario and across Canada.

2.1 Fire Protection and Prevention Act

Within the Province of Ontario, the relevant legislation for the operation of a fire department and the delivery of fire protection services are contained within the Fire Protection and Prevention Act, 1997 (F.P.P.A.). The F.P.P.A. establishes that a municipality shall:

> (a) establish a program in the municipality which must include public education with respect to fire safety and certain components of fire prevention, and,
> (b) provide such other fire protection services as it determines may be necessary in accordance with its needs and circumstances.

2.1.1 Ontario Regulation 378/18: Community Risk Assessments

On July 1st, 2019 the Province of Ontario enacted Ontario Regulation 378/18 – Community Risk Assessments (O. Reg. 378/19) as an act empowered by the F.P.P.A. This new regulation requires every municipality in the province to develop a Community Risk Assessment (C.R.A.) by July 1st, 2024. A municipality must 'use its community risk assessment to inform decisions about the provision of fire protection services'[1].

As prescribed by the O. Reg. 378/18 a C.R.A. must include an assessment of nine mandatory profiles including:

1. Geographic Profile;
2. Building Stock Profile;
3. Critical Infrastructure Profile;
4. Demographic Profile;
5. Public Safety and Response Profile;
6. Community Services Profile;

[1] Ontario Regulation 378/18 Community Risk Assessments, Mandatory Use 1.(b)

7. Hazard Profile;
8. Economic Profile; and,
9. Past Loss and Event History Profile.

The new O. Reg. 387 Community Risk Assessment regulation will replace the current Simplified Risk Assessment (S.R.A.) requirements contained within the F.P.P.A. For this study, the current S.R.A. prepared by the P.F.S. has been utilized to identify the existing fire related risks within the City.

2.2 Occupational Health and Safety Act

The Occupational Health and Safety Act, R.S.O. 1990 requires every employer to, "take every precaution reasonable in the circumstances for the protection of the worker"[7]. The O.H.S.A. provides for the appointment of committees, and identifies the Ontario Fire Services Section 21 Advisory Committee as the advisory committee to the Minister of Labour with the role and responsibility to issue guidance notes to address firefighter-specific safety issues within Ontario. These guidelines are referred to as Section 21 Firefighter Guidance Notes.

2.3 National Fire Protection Association (NFPA)

The National Fire Protection Association (N.F.P.A.) is an international non-profit organization that was established in 1896. The organization's mission is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating consensus, codes and standards, research, training, and education. With a membership that includes more than 70,000 individuals from nearly 100 nations, N.F.P.A. is recognized as one of the world's leading advocates of fire prevention and an authoritative source on public fire safety.

N.F.P.A. is responsible for 300 codes and standards that are designed to minimize the risk and effects of fire by establishing criteria for building, processing, design, service, and installation in the United States, as well as many other countries. It has more than 200 technical code and standard development committees that are comprised of over 6,000 volunteer seats. Members vote on proposals and revisions in a process that is accredited by the American National Standards Institute (A.N.S.I.). Over the past decade the Ontario fire service has been transitioning to the use of N.F.P.A. standards to guide many of the services they provide.

The N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition) was utilized to inform the fire suppression deployment analysis within this study.

2.3.1 N.F.P.A. 1710 Standard (2020 Edition)

The N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition) provides fire suppression staffing performance benchmarks for municipalities that utilize only career (full-time) firefighters. This standard identifies minimum firefighter deployment benchmarks based on the fire risks present within a range of building occupancy types and fire related risks. The N.F.P.A. 1710 Standard includes the following fire suppression deployment models based on the type of building occupancy and potential fire risks present:

- Initial Arriving Company (e.g. pumper);
- Second Arriving Company
- Single-Family Dwelling Initial Full Alarm Assignment;
- Open-Air Strip Shopping Center Initial Full Alarm Assignment;
- Apartment Initial Full Alarm Assignment; and,
- High-Rise Full Alarm Assignment.

For the purposes of this study, the evaluation includes consideration of the Initial Arriving Company, Second Arriving Company, and Single-Family Dwelling Initial Full Alarm Assignment performance benchmarks. These benchmarks are the most relevant for the purpose of assessing fire station location.

2.3.1.1 Initial Arriving Company

The Initial Arriving Company is commonly referenced within the fire service as the initial responding apparatus deployed to respond to an emergency incident (typically a pumper). Fire service leaders and professional regulating bodies have agreed that until a sufficient number of firefighters are initially assembled on-scene, initiating tactics such as entry into the building to conduct search and rescue, or initiating interior fire suppression operations are not safe practices. If fewer than four firefighters arrive on scene, they must wait until a second apparatus, or additional firefighters arrive on scene to have sufficient staff to commence these initial activities.

Within the N.F.P.A. 1710 Standard an 'Initial Arriving Company' is referenced as an 'Engine Company' with a minimum staffing of four firefighters whose primary functions are to pump and deliver water and perform basic firefighting at fires, including search and rescue.

The City's current fire suppression deployment model ensures the response of an "Initial Arriving Company" with a minimum staffing of four firefighters as referenced in the N.F.P.A. 1710 Standard by staffing all first-due apparatus (i.e. pumper) in each of the City's three existing fire stations with a minimum of four firefighters at all times. The City's existing Collective Agreement also requires a front-line pumper to be staffed with four firefighters.

The N.F.P.A. 1710 fire suppression deployment model for the initial arriving company requires a minimum of four firefighters arriving on scene with an 'Engine Company' within a four minute (240 seconds) travel time to 90% of the fire suppression incidents.

2.3.1.2 Second Arriving Company

The N.F.P.A. 1710 Standard (2020 Edition) includes a new performance benchmark for the deployment and arrival of the second responding apparatus. The standard does not reference a specific type of apparatus for the second arriving company but does require that it be staffed with a minimum of four firefighters. The term 'company' in this standard can be defined as "being usually organized and identified as engine companies, ladder companies, rescue companies, squad companies or multi-functional companies"[2]

The N.F.P.A. 1710 fire suppression deployment model for the second arriving company requires a minimum of four firefighters arriving on scene with a 'Second Company' within a six minute (360 seconds) travel time to 90% of the fire suppression incidents.

2.3.1.3 **Single-Family Dwelling - Initial Full Alarm Assignment**

In comparison to the deployment of an 'Initial Arriving Company' the term 'Initial Full Alarm Assignment' refers to "Those personnel, equipment, and resources ordinarily dispatched upon notification of a structure fire"[3]. An initial full alarm assignment represents the 'total' number of firefighters initially deployed to a structure fire.

In this deployment standard, a single-family dwelling is defined as "a typical 2,000 ft^2 (186 m^2) two-story single-family dwelling without basement and with no exposures"[4]. This definition is a further example of the broad definitions utilized by the N.F.P.A. that in this instance may not necessarily represent the definition of a typical single-family dwelling in Ontario. Most single-single family dwellings in Ontario have basements to accommodate heating systems and more.

The N.F.P.A. 1710 fire suppression deployment model for an initial full alarm assignment to a single-family dwelling includes a minimum deployment of 16 firefighters (17 if an aerial device is used) described as the 'total effective response force' arriving on scene within an eight minute (480 second) travel time to 90% of the fire suppression incidents in this occupancy type.

[2] N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition) Chapter 3 Definitions, Section 3.3.15

[3] N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition) Chapter 3 Definitions, Section 3.3.40 Initial Full Alarm Assignment

[4] N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition) Chapter 5 Fire Department Services, Section 5.2.4.1.1

3.0 Methodology

This section of the report outlines the overall evaluation process, the comparative evaluation considerations (i.e. criteria and indicators) for selecting the potential Station 2 sites, as well as the G.I.S. modelling methodology and the assumed deployment model used in the assessment

3.1 Overall Evaluation Process

The evaluation process addressed the following:

- Identify potential Station 2 locations within a four station model through a multi-criteria comparative evaluation;
- Assess how the identified Station 2 locations compare to the existing Station 2 location in terms of response coverage in a three station model; and,
- Assess how the relocation of Station 2 and the addition of a fourth station affects the service levels in terms of response coverage compared to a three station model.

3.2 Rank Evaluation Approach (Four Station Model)

A set of evaluation criteria were developed and are presented in Table 2. These evaluation criteria cover the range of considerations that are deemed important to informing the ranking of the Station 2 location options, including fire related risk and applicable N.F.P.A. 1710 (2020 Edition) performance benchmarks. The evaluation criteria are:

1. Initial Arriving Company (4 firefighters (FF) arriving in 4 minute travel time);
2. Second Arriving Company (8 FF arriving in 6 minute travel time);
3. Single-Family Dwelling - Initial Full Alarm Assignment (minimum deployment of 16 FF arriving in 8 minutes of travel time)[5];
4. Risk;
5. Cost;
6. Site Characteristics; and,
7. Land Use.

For each criterion a number of indicators were developed to measure the criterion. The indicators included were deemed important considerations in helping to measure the criterion. The indicators are included in Table 2 along with a description of what is being measured and the rationale for their inclusion.

[5] 17 firefighters if an aerial device is used. For analysis purposes 16 firefighters was used, but it is recognized that P.F.S. can achieve 17 firefighters wherever they can achieve 16 firefighters as the aerial device staffed with one fire fighter is located at Station 1.

The criteria are used as part of an evaluation process which is the method of bringing together all of the information gathered and developed that describes each site option (i.e. the criteria and indicators) and arrives at the site rankings. The process includes the ranking of each site option for each indicator, and using those results to first develop a ranking of the sites options for each criterion through the use of a pairwise comparison. A pairwise comparison means that each site option is compared to every other site option. With five Station 2 options and two Station 4 options there are a total of 10 site options, resulting in 45 pairwise comparisons per criteria. The number of wins in these comparisons results in the ranking of the sites options (i.e. the site option with the most wins is ranked first, the one with second most wins ranked second, and so on). A second step then takes the site option rankings by criterion to produce an overall ranking of the sites options. The overall ranking also involved a pairwise comparison analysis.

As part of the evaluation process it is recognized that not all of the criteria are equally important and similarly not all of the indicators used to assess the criteria are of equal importance. The evaluation process therefore incorporates a High, Medium and Low importance to the criteria and indicators.

Table 2: Evaluation Criteria

Criteria Priority	Criteria	Indicator Priority	Indicator	Description	Rationale
High	Initial Arriving Company (4 FF arriving in 4 minutes of travel time)	High	% Historic Calls Covered	Percent of historic calls covered by the arrival of 4 firefighters within 4 minutes of travel time.	A direct measure of the coverage performance of the option based on actual call data.
		High	% Municipal Area Covered	Percent of municipal area (geography) covered by the arrival of 4 firefighters within 4 minutes of travel time.	A measure of the coverage performance of the option based on the coverage of the entire municipality. Area is used because we don't know where the future calls will be, particularly in the growth areas.
		High	% Road Length Covered	Percent of future road length covered by the arrival of 4 firefighters within 4 minutes of travel time.	Road length is a proxy for coverage performance
Medium	Second Arriving Company (8 FF arriving in 6 minutes of travel time)	High	% Historic Calls Covered	Percent of discrete historic calls covered by the second arriving company of 4 firefighters within 6 minutes of travel time.	A direct measure of the coverage performance of the option based on actual call data.
		High	% Municipal Area Covered	Percent of municipal area (geography) covered by the second arriving company of 4 firefighters within 6 minutes of travel time.	A measure of the coverage performance of the option based on the coverage of the entire municipality. Area is used because we don't know where the future calls will be, particularly in the growth areas.
		High	% Road Length Covered	Percent of existing and future road length covered by the second arriving company of 4 firefighters within 6 minutes of travel time.	Road length is a proxy for coverage performance
Low	Single-Family Dwelling Initial Full Alarm Assignment (16 FF arriving in 8 minutes of travel time)	High	% Historic Calls Covered	Percent of discrete historic calls covered by the arrival of 16 firefighters within 8 minutes of travel time.	A direct measure of the coverage performance of the option based on actual call data.
		High	% Municipal Area Covered	Percent of municipal area (geography) covered by the arrival of 16 firefighters within 8 minutes of travel time.	A measure of the coverage performance of the option based on the coverage of the entire municipality. Area is used because we don't know where the future calls will be, particularly in the growth areas.
		High	% Road Length Covered	Percent of existing and future road length covered by the arrival of 16 firefighters within 8 minutes of travel time.	Road length is a proxy for coverage performance
High	Risk	High	Geographical Features Nearby	Geographic features that may impact the response coverage of the site (e.g., water features, rail lines, etc.).	Identified geographic features that could influence station location consideration such as water features (due to road connectivity), flood plains, and rail lines.
		High	% of residential land uses covered by 4 FF within 4 min of travel time	Residential land uses covered.	Residential occupancies frequently comprise a large proportion of historic fires, injuries, and fatalities.
		High	% of residential land uses covered by 8 FF within 6 min of travel time	Residential land uses covered.	Residential occupancies frequently comprise a large proportion of historic fires, injuries, and fatalities.
		High	% of residential land uses covered by 16 FF within 8 min of travel time	Residential land uses covered.	Residential occupancies frequently comprise a large proportion of historic fires, injuries, and fatalities.
High	Cost	High	Land Cost	Land cost per acre times the number of acres	A significant portion of the total cost to build a station
		High	Servicing Cost	Ability to service the site including water, wastewater, and stormwater servicing.	A potentially significant portion of the total cost to build a station
		High	Estimated Design / Construction Costs	Cost estimate ($) for design and construction.	A significant portion of the total cost to build a station. This could include additional architectural design related costs.

Criteria Priority	Criteria	Indicator Priority	Indicator	Description	Rationale
Medium	Site Characteristics	Low	Portion of Site to be Used	Portion of the site to be used in acres.	The site has to have a minimum size (1.5 acres)
		Medium	Ownership	Ability to acquire the site, if applicable.	The need for site acquisition could be costly and time consuming and could potentially face unknown barriers.
		High	Site Accessibility to/from road network	Ability to connect the site to the area road network for ingress and egress and proximity to Collector or Arterial roads.	An accessible site, such as one at an intersection, provides options to access the nearby road network and is in close proximity to collector or arterial roads.
		High	Site Constraints / Concerns	Other unique site-specific constraints or concerns not reflected in the other criteria.	Specific sites can come with their own histories and contexts. This indicator permits consideration of any unique consideration (e.g. potentially contaminated sites).
Low	Land Use	Low	Permitting / Process Requirements	Permitting or process requirements such as: OPA, ZBA, ORCA DCA.	Permitting process could incur a time and financial cost
		Medium	Compatibility with Surrounding Neighbourhood	Surrounding land use designations and any potential related land use compatibility concerns.	Consideration to the fit within an existing neighbourhood based on the land use in the area.

3.3 Fire Related Risk Considerations

As discussed in Section 2.1, recently introduced O. Reg. 378/18 requires municipalities to make decisions regarding the provision of fire protection services with consideration to the findings of a community risk assessment. The fire related risks considered as part of this study were informed by the 2019 Simplified Risk Assessment (S.R.A.) conducted by P.F.S. and discussions with City staff. The following summarizes the key risk considerations that are applicable to the scope of this study:

- McFarlane Street bridge has a weight restriction which results in fire apparatus not being able to cross. This restriction was built into the GIS road network;
- The occurrence of historical emergency incidents are clustered in the downtown core of the City;
- The Otonabee River and the Trent Canal run north-south in the eastern extent of the City. This impacts the number of east-west road connections available to respond to the eastern part of the City. It also results in the potential hazard of flooding;
- The S.R.A. identifies that Group C – Residential occupancies comprise 89% of the City's building stock;
- Group C – Residential occupancies account for 80.1% of structure fires from 2015 to 2019;
- Of the dollar loss from 2015 to 2019 structure fires, 59.8% occurred in Group C – Residential occupancies; and,
- Of the 57 injuries occurring from 2015 to 2019, 95% occurred in Group C – Residential occupancies. (The one fatality occurring over this same period occurred in a Group F – Industrial occupancy).

These findings from the S.R.A. and 2018 to 2019 fire loss data provided by the department are considered as part of the evaluation process as presented in the prior section.

3.4 G.I.S. Modelling Methodology & Growth Considerations

The fire suppression response modelling was conducted by City of Peterborough staff using G.I.S. This included using relevant base road information, such as road length and road classification to simulate the future emergency response fire suppression deployment capabilities of the P.F.S. navigating the City's road network. To reflect future emergency response, the road network was updated to include future roads identified by the City to accompany future growth. These future roads reflect the identified growth areas including the Lily Lake subdivision (in the west), the Lift Lock subdivision (in the east), Cold Springs area (in the south), and some potential growth at Trent University as identified in consultation with City Planning and Development Services.

The historic call locations for emergency response incidents for the period from January 1, 2015 to December 31, 2019 were added to the model and their location and travel times to incidents were utilized to calibrate the model. Calibrating the model is an iterative process whereby the posted speeds in the model are adjusted to match and reflect historic travel times of the first responding apparatus for all calls with an emergency response code.

Table 3 identifies the current posted speeds for the existing road network and the adjusted modelled speeds to reflect the actual historical response capabilities of the P.F.S. The G.I.S. calibrated model was then used to assess the applicable fire suppression performance for alternative station location options.

Table 3: GIS Model Calibration

Posted Speed Limit (km/hr)	Modelled Speed (km/hr)
40	39
50	39
60	50
70	60
80	70
100	90

3.5 Four Station Model - Assumed Deployment Model

As discussed in **Section 1.1**, the P.F.S. current fire suppression deployment model includes a minimum of 15 firefighters on duty at all times. What is critical for the station location assessment is that each first due apparatus has four firefighters. The options for relocating Station 2 have assumed that the City will be developing a fourth fire station in response to continued community growth in the future. For that reason, the minimum staffing modelled for the Fire Station 2 location assessment is based on a minimum complement of 19 firefighters being on duty at all times as illustrated in Table 4. This reflects the addition of a first due pumper staffed with a minimum of four firefighters at a fourth station. This minimum staffing is consistent with the current Collective Agreement and industry best practice.

The phasing and timing of increasing staffing for a future deployment model has not been addressed within the context of this study. It is anticipated that this will be reviewed by the City in detail at a later date, informed by the completion of a Community Risk Assessment, following Ontario Regulation 378/18 which is currently underway, and other analyses. This should provide a comprehensive perspective of the future needs of the City and will set the stage for the evolution of the department to a possible four station model, including an appropriate plan for getting to the supporting deployment model.

Table 4: Assumed Deployment Model for Fire Station 2 Review – Four Stations

Station	Apparatus	Assumed Minimum Staffing
1	Pumper	4
	Command	2
	Aerial	1
2	Pumper	4
3	Pumper	4
4	Pumper	4
	# of Firefighters on Duty	19

It should be noted that the purpose of this assessment is to identify highly ranked potential Station 2 sites. The two Station 4 options and the actual future deployment model are simply representative in order to carry out the Fire Station 2 location analysis with a reasonable set of assumptions of the possible future conditions. It does not commit the municipality to a fourth station or the assumed deployment model.

In selecting the two Station 4 locations, a number of model runs were performed by the City to try and assess good and representative station location options for Station 4. Through this process, two representative locations were identified and these were then paired with each of the five Station 2 options to carry out the assessment. One of the two Station 4 options is represented as the intersection of Ashburnham Drive and Lansdowne Street East. This is located on the east side of the Otonabee River and can be considered representative of actual sites in the vicinity of the intersection.

The second Station 4 option is located in the western part of the City in the vicinity of the Parkhill Road West and Ravenwood Drive intersection and can be considered representative of actual sites in the vicinity of the intersection. The evaluation and ranking of individual criterion therefore considered ten possible options of stations as identified in Table 5.

Table 5: Options Evaluated – Four Station Model

Station 4 – Location 1	Station 2 Potential Locations	Station 4 – Location 2	Station 2 Potential Locations
Ashburnham Site	Dennistoun	Parkhill Site	Dennistoun
	Northcrest		Northcrest
	Towerhill		Towerhill
	Sunset		Sunset
	Heritage		Heritage

4.0 Station Location Analysis

This section includes the analysis, results and commentary regarding the relocation of Station 2. This begins with the analysis and results of the evaluation of the five potential Station 2 locations within a potential future four station model. The possibility of a fourth station was identified in the February 16, 2010 report to the Committee of the Whole. It is therefore prudent to assess and identify a relocated Station 2 in light of a possible future four station model. The highly ranked Station 2 sites in a four station model are then assessed within the context of a three station model for fire suppression response performance as compared to the existing response capabilities, as this will be the nearer term operating condition. Finally, a comparison of the fire suppression response performance capabilities of a three station model are compared to a four station model to highlight the potential advantages of a four station model.

4.1 Station 2 Location Analysis

4.1.1 Comparative Evaluation

The criteria, indicators and the resultant inputs used within the evaluation are presented in Appendix A. This includes the G.I.S. modelling results for Initial Arriving Company, Second Arriving Company, Single-Family Dwelling Initial Full Alarm Assignment, and Risk. It also includes other inputs including those criteria related to Site Characteristics, Cost and Land Use. Before Dillon proceeded with the comparative evaluation, City staff provided in-depth input and review through consultation with the fire department, Infrastructure and Planning Services, and the Transportation Division. Using these inputs, Dillon undertook the comparative evaluation described in Section 3.2.

First, each indicator was ranked across all of the sites from 1 to 10 (more preferred to less preferred) as shown in Appendix B. For the indicators within a criterion, they were evaluated through a pairwise comparison to identify a rank order for each site option by each criterion overall. The results of this analysis by criterion is found in Appendix C. Mapping results of Initial Arriving Company modelling with Station 4 located at the Ashburnham site can be found in Appendix D and for the Parkhill site in Appendix E.

The overall ranking results for each site option by criterion from 1 to 10 (best to worst) are presented in Table 6. This is the result of the indicator assessment within each criterion. This information was used to carry out the overall evaluation of the site options. The purpose of this overall pairwise comparison was to identify highly ranked potential Station 2 locations within a four station model. The details of the pairwise comparison for the overall analysis can be found in Appendix F. This includes a pairwise comparison based on some criteria being High priority (Initial Arriving Company, Risk, and Cost), Medium priority (Second Arriving Company, Site Characteristics), and Low priority (Initial Full Alarm Assignment, Land Use). Preference was given to those sites that had more paired comparison wins

within the High priority criteria, then the Medium priority and finally the Low priority criteria. In some cases, where the preferred site was not obvious, consideration was given to the magnitude of the difference in the actual data at the indicator level. For example, when the site that won on a High priority criterion had a loss on one or more lower priority criteria, the magnitude of the difference in the actual data was considered to select the preferred site overall.

The results of the overall pairwise comparison as shown in Appendix F illustrate that three sites warrant further consideration by the City in regards to the relocation of Station 2:

- Dennistoun;
- Sunset; and,
- Northcrest.

The results also indicate that for each pair of Station 2 location options, the Ashburnham site is preferred to the Parkhill site and within each Station 4 option, Dennistoun, Sunset and Northcrest are the highly ranked sites. While there is a preference for the Ashburnham site on the east side of the Otonabee River, the purpose of this evaluation was not to select a preferred Station 4 site and the location evaluated was simply representative of possible future Station 4 locations.

4.1.2 Summary of Findings

The pairwise comparative evaluation takes a range of considerations (i.e. criteria and indicators) in a multi-criteria analysis and synthesizes the data in a way that helps the best options to come out on top. The data for the options can range across the indicators and criteria and it is not always immediately apparent which options are best. At a high level, the Dennistoun, Sunset, and Northcrest sites ranked higher more often and for the more important criteria than Towerhill and Heritage Trail. Certainly response coverage, risk and cost all played an important role in these results. In addition, all three sites are owned by the City and do not need to be acquired.

The follow subsections provide further analysis as to the how the three potential sites compare to the existing Station 2 location within the context of a four station model and in the context of a three station model.

Table 6: Ranking by Criterion

	Station 4 – Ashburnham Location with Station 2 Potential Location					Station 4 – Parkhill Location with Station 2 Potential Location				
Criteria [Priority]	Dennistoun	Northcrest	Towerhill	Sunset	Heritage	Dennistoun	Northcrest	Towerhill	Sunset	Heritage
Initial Arriving Company (4 FF arriving in 4 minutes of travel time) [High]	6	2	4	1	8	9	3	7	5	10
Second Arriving Company (8 FF arriving in 6 minutes of travel time) [Medium]	1	5	4	3	8	2	7	9	6	10
Single-Family Dwelling Initial Full Alarm Assignment (16 FF arriving in 8 minutes of travel time) [Low]	3	8	6	5	10	2	7	4	1	9
Risk [High]	2	7	5	4	9	1	8	6	2	10
Cost [High]	1	1	7	1	7	1	1	7	1	7

	Station 4 – Ashburnham Location with Station 2 Potential Location					Station 4 – Parkhill Location with Station 2 Potential Location				
Criteria [Priority]	Dennistoun	Northcrest	Towerhill	Sunset	Heritage	Dennistoun	Northcrest	Towerhill	Sunset	Heritage
Site Characteristics [Medium]	5	5	1	5	1	5	5	1	5	1
Land Use [Low]	7	7	3	1	3	7	7	3	1	3

4.1.3 Comparison to Existing Station 2 Location in a Four Station Model

To provide context on the impact of the relocation of Station 2 within a four station model, additional modelling was undertaken to assess the existing Station 2 location with the assumed deployment capabilities of 19 firefighters. Table 7 compares the existing Station 2 location to the three identified sites (i.e. Dennistoun, Sunset and Northcrest) for the fire suppression emergency response performance benchmarks as measured by the Initial Arriving Company, the Second Arriving Company, and the Single-Family Dwelling Initial Full Alarm Assignment criteria.

Table 8 demonstrates that the relocation of Station 2 a little further to the south results in improved response coverage across the City for almost all criteria and all three sites. The exception is Dennistoun for the Initial Arriving Company as measured by the indicators "% of Municipal Area Covered" and "% of Road Area Covered" where the existing site has a slight advantage. For the "% of Historic Calls Covered" indicator and for all of the Second Arriving Company and Single Family Dwelling Initial Full Alarm indicators, Dennistoun is preferred to the existing Station 2 location.

Overall, all three sites reflect a shift south which provides a distinct advantage for being able to deliver additional resources to an area with a historically higher density of calls (i.e. the downtown), while still maintaining good or better Initial Arriving Company coverage City-wide. While there are small areas in the northern limits of the City that will receive marginally reduced initial arriving company emergency response times, the benefits accrue City-wide as noted.

Table 7: Emergency Response Performance Benchmark Comparison - Existing Station 2 Location in Four Station Model

Options	Initial Arriving Company (4 FF in 4 Minutes Travel Time, 90%)			Second Arriving Company (8 FF in 6 Minutes Travel Time, 90%)			Single-Family Dwelling Initial Full Alarm Assignment (16 FF in 8 Minutes Travel Time, 90%)		
	% Historic Calls Covered	% Municipal Area Covered	% Road Length Covered	% Historic Calls Covered	% Municipal Area Covered	% Road Length Covered	% Historic Calls Covered	% Municipal Area Covered	% Road Length Covered
Ashburnham									
& Existing Station 2	77.3%	49.3%	55.1%	71.0%	35.9%	45.3%	19.6%	3.5%	7.4%
& Dennistoun	80.4%	48.5%	54.3%	78.1%	41.9%	51.7%	52.8%	17.1%	26.8%
& Sunset	81.5%	51.1%	56.9%	78.0%	41.0%	51.1%	50.9%	15.2%	24.8%
& Northcrest	81.1%	49.7%	57.5%	76.9%	39.1%	49.9%	35.9%	7.7%	14.7%
Parkhill									
& Existing Station 2	78.1%	48.1%	55.0%	63.6%	29.4%	41.5%	20.5%	4.1%	8.2%
& Dennistoun	80.2%	47.1%	53.8%	78.0%	41.2%	52.8%	52.7%	18.0%	27.6%
& Sunset	81.0%	49.0%	55.9%	76.7%	37.2%	49.1%	53.7%	18.4%	28.0%
& Northcrest	81.7%	48.4%	56.7%	73.0%	32.6%	45.4%	36.6%	9.0%	16.1%

4.2 Three Station Model

While the P.F.S. may evolve to a future four station model, there will be a period of time when the department will provide fire suppression services with a three station model and a relocated Station 2. To understand the impacts on the fire suppression emergency response performance benchmarks, additional modelling for the three highly ranked sites was undertaken.

Table 8 compares the existing Station 2 location to the three identified sites within a three station model for the fire suppression emergency response performance benchmarks as measured by the Initial Arriving Company, the Second Arriving Company, and the Single-Family Dwelling Initial Full Alarm Assignment criteria. The mapping results for Initial Arriving Company can be found in Appendix G. The fire suppression staffing that was modelled as part of this analysis is based on the existing staffing levels and deployment model which is a minimum staffing of 15 firefighters.

Table 8: Emergency Response Performance Benchmarks Comparison - Station 2 Existing and Potential Locations in Three Station Model

Options	Initial Arriving Company (4 FF in 4 Minutes Travel Time, 90%)			Second Arriving Company (8 FF in 6 Minutes Travel Time, 90%)			Single-Family Dwelling Initial Full Alarm Assignment[1] (16 FF in 8 Minutes Travel Time, 90%)		
	% Historic Calls Covered	% Municipal Area Covered	% Road Length Covered	% Historic Calls Covered	% Municipal Area Covered	% Road Length Covered	% Historic Calls Covered	% Municipal Area Covered	% Road Length Covered
Existing Station 2	71.9%	38.8%	45.3%	54.5%	22.6%	32.0%	20.5% (15 FF)	4.1% (15 FF)	8.2% (15 FF)
Dennistoun	75.1%	38.2%	44.8%	74.9%	37.1%	47.7%	61.3% (15 FF)	24.3% (15 FF)	35.5% (15 FF)
Sunset	76.1%	40.1%	47.1%	73.7%	32.7%	44.0%	60.5% (15 FF)	22.9% (15 FF)	33.9% (15 FF)
Northcrest	75.8%	39.3%	47.5%	69.6%	27.8%	39.7%	38.9% (15 FF)	10.1% (15 FF)	17.4% (15 FF)

[1] *It is important to note that the performance benchmark of 16 firefighters in 8 minutes cannot be achieved within existing conditions* as the minimum staffing level in these scenarios is 15 firefighters. Metrics are provided in the table for reference purposes only and are *not comparable to response coverage in a four station model with minimum staffing in excess of 16 firefighters.*

Table 8 demonstrates that within the context of a three station model the relocation of Station 2 further to the south results in improved emergency response performance across the City for almost all criteria and all three sites.

Initial Arriving Company

Of the three fire suppression performance benchmark criteria, the Initial Arriving Company criteria sees the smallest improvements for each potential identified site. For this criteria, the biggest increase is to 76.1% of "% Historic Calls Covered" for the Sunset location which is a 4.2% increase from the existing performance of 71.9%. The exception to improvements is Dennistoun for the Initial Arriving Company as measured by the indicators "% of Municipal Area Covered" and "% of Road Area Covered" where the existing site has a slight (0.6%) advantage. While most of the Initial Arriving Company indicators reflect an overall increase, the modelling results as presented in Appendix G illustrate a shift in coverage due to moving Station 2 further south and closer to the other existing station. As referenced in Section 4.1.2, however, this shift results in accrued benefits City-wide in regards to Second Arriving Company and Initial Full Alarm Assignment.

Second Arriving Company

The increase in the Secondary Arriving Company performance benchmark of 8 firefighters arriving on scene in 6 minutes of travel time highlights a benefit of relocating Station 2 further south. As compared to the existing Station 2 site, the Dennistoun, Sunset, and Northcrest sites all result in a higher % of Historic Calls Covered, Municipal Area Covered, and Road Length Covered as illustrated in Table 8.

Single-Family Dwelling - Initial Full Alarm Assignment

The Initial Full Alarm Assignment emergency response performance capabilities within a three station model were assessed in comparison to the performance benchmark of 16 firefighters arriving on scene within an 8 minute travel time to 90% of incidents. Based on the department's current minimum staffing of 15 firefighters on duty, the department is currently unable to achieve the benchmark of 16 firefighters on regular basis.

To provide some perspective on the potential capabilities, Table 8 illustrates the capabilities of 15 firefighters in 8 minutes of travel time. It is important to note that this modelling is for illustration purposes to provide an order of magnitude change for the relocation of Station 2 and these results should not be compared to the results of the four station model initial alarm results, which are based on 16 firefighters.

With Station 2 in its existing location, 15 firefighters can reach 20.5% of Historic Calls, 4.1% of Municipal Area, and 8.2% of Road Length in 8 minutes of travel time. Relocating Station 2 further south moves the station closer to the Downtown. Because of this shift, each of three highly ranked sites result in an improved emergency response performance capability for each initial full alarm assignment indicator as compared to the existing Station 2 site for 15 firefighters. The Dennistoun and Sunset sites see the biggest increase for all initial full alarm assignment indicators; for example, covering 61.3% (+40.8%) and 60.5% (+39.9%) of Historic Calls respectively. The Northcrest site also results in an increase for all indicators resulting in 38.9% (+18.4%) of Historic Calls, 10.1% (+6.0%) of Municipal Area, and 17.4% (+9.2%) of Road Length. Consideration should be given to increase the minimum staffing to 16 firefighters in order to enhance the performance capability as compared to the NFPA 1710 (2020) Single-Family Dwelling Initial Full Alarm Assignment emergency response performance benchmark.

4.3 Three Station Model vs Four Station Model

While the purpose of this analysis was not to assess or select a preferred Station 4 location, analyses was carried out to facilitate a comparison between a three station model and a four station model, both with a relocated Station 2. Clearly one would expect improvements in response coverage and the analyses bears this out.

Table 9 summarizes the response coverage results for Initial Arriving Company and Second Arriving Company. For illustrative purposes the four station model results are shown with the Ashburnham Station 4 site. A four station model produces better response coverage across these emergency response performance benchmarks and related indicators for all relocated Station 2 options. For the Initial Full Alarm Assignment, the four station model includes the addition of a pumper vehicle and four firefighters in the fourth station, increasing the minimum staffing to 19 firefighters. This would enable the City to meet the performance benchmark for the Single-Family Dwelling - Initial Full Alarm Assignment of 16 firefighters within 8 minutes of travel time to some parts of the city (mostly in the downtown area). With the three station model results, staffing remains at 15 firefighters and doesn't achieve the minimum staffing requirement of the benchmark.

As growth in the City continues over the coming years the increased response coverage achieved by the addition of a fourth station will be important to maintain existing response capabilities and to respond to the changing nature of the risk including the potential for an increase in call volume as the population grows. Increases in higher densities through infill development and multi-storey buildings also changes the nature of the risk, making depth of coverage as measured by the Second Arriving Company and the Initial Full Alarm Response increasingly important. Vertical response inside of multi-storey occupancies requires more staff than is required for a single family dwelling.

Table 9: Emergency Response Performance Benchmarks Comparison – Three Station Model vs. Four Station Model

Options	Initial Arriving Company (4 FF in 4 Minutes Travel Time, 90%)			Second Arriving Company (8 FF in 6 Minutes Travel Time, 90%)		
	% Historic Calls Covered	% Municipal Area Covered	% Road Length Covered	% Historic Calls Covered	% Municipal Area Covered	% Road Length Covered
Three Station Model – Minimum Staffing of 15 Firefighters						
Existing Station 2	71.9%	38.8%	45.3%	54.5%	22.6%	32.0%
Dennistoun	75.1%	38.2%	44.8%	74.9%	37.1%	47.7%
Sunset	76.1%	40.1%	47.1%	73.7%	32.7%	44.0%
Northcrest	75.8%	39.3%	47.5%	69.6%	27.8%	39.7%
Four Station Model (with Ashburnham) – Assumed Minimum Staffing of 19 Firefighters						
Existing Station 2	77.3%	49.3%	55.1%	71.0%	35.9%	45.3%
Dennistoun	80.4%	48.5%	54.3%	78.1%	41.9%	51.7%
Sunset	81.5%	51.1%	56.9%	78.0%	41.0%	51.1%
Northcrest	81.1%	49.7%	57.5%	76.9%	39.1%	49.9%

5.0 Conclusion & Next Steps

The analysis in this report has assessed alternative site location for a relocated Station 2. It has done this taking into consideration the possible future addition of a fourth station to ensure any decision made in the short term about Station 2 does not compromise future decisions about the location of a four station model.

The analyses identified three highly ranked sites for a potential relocation of Station 2; Dennistoun, Sunset, and Northcrest. In order to proceed to more definitive plans about a particular site for the relocation of Station 2, City staff will be undertaking a more detailed assessment of the requirements to realize one of the sites. This includes more detailed costing, servicing needs, approval requirements, and opportunities for co-location. This can now be undertaken with the knowledge that three sites will work well to improve existing response coverage in a three station model and that the preferred location will not compromise the evolution of the P.F.S. to a four station model.

Appendix A

Criterion Evaluation Inputs

DILLON CONSULTING

Criteria [Priority]	Indicator Priority	Indicator	Station 4 – Ashburnham Location with Station 2 Potential Location					Station 4 – Parkhill Location with Station 2 Potential Location				
			Dennistoun	Northcrest	Towerhill	Sunset	Heritage	Dennistoun	Northcrest	Towerhill	Sunset	Heritage
Initial Arriving Company (4 FF arriving in 4 minutes of travel time) [High]	High	% Historic Calls Covered	80.4%	81.1%	76.3%	81.5%	75.9%	80.2%	81.7%	76.1%	81.0%	76.5%
	High	% Municipal Area Covered	48.5%	49.7%	49.6%	51.1%	48.1%	47.1%	48.4%	48.4%	49.0%	46.7%
	High	% Road Length Covered	54.3%	57.5%	56.2%	56.9%	54.2%	53.8%	56.7%	55.7%	55.9%	53.7%
Second Arriving Company (8 FF arriving in 6 minutes of travel time) [Medium]	High	% Historic Calls Covered	78.1%	76.9%	77.2%	78.0	69.8%	78.0%	73.0%	68.7%	76.7%	62.7%
	High	% Municipal Area Covered	41.9%	39.1%	39.7%	41.0%	35.2%	41.2%	32.6%	31.8%	37.2%	28.8%
	High	% Road Length Covered	51.7%	49.9%	50.4%	51.1%	44.2%	52.8%	45.4%	43.6%	49.1%	40.8%
Single-Family Dwelling Initial Full Alarm Assignment (16 FF arriving in 8 minutes of travel time) [Low]	High	% Historic Calls Covered	52.8%	35.9%	44.2%	50.9%	14.0%	52.7%	36.6%	49.3%	53.7%	14.7%
	High	% Municipal Area Covered	17.1%	7.7%	10.8%	15.2%	2.8%	18.0%	9.0%	16.0%	18.4%	3.3%
	High	% Road Length Covered	26.8%	14.7%	19.3%	24.8%	6.1%	27.6%	16.1%	25.3%	28.0%	6.8%
Risk [High]	High	Geographical Features Nearby	The City is bisected by the Otonabee River and there are a limited number of crossing opportunities in the vicinity of the site. There are no other significant geographic feature constraints in the	The City is bisected by the Otonabee River and there are a limited number of crossing opportunities in the vicinity of the site. There are no other significant geographic feature constraints in the	The City is bisected by the Otonabee River and there are a limited number of crossing opportunities in the vicinity of the site. There are no other significant geographic feature constraints in the	The City is bisected by the Otonabee River and there are a limited number of crossing opportunities in the vicinity of the site. There are no other significant geographic feature constraints in the	The City is bisected by the Otonabee River and there are a limited number of crossing opportunities in the vicinity of the site. There are no other significant geographic feature constraints in the	The City is bisected by the Otonabee River and there are a limited number of crossing opportunities in the vicinity of the site. There are no other significant geographic feature constraints in the	The City is bisected by the Otonabee River and there are a limited number of crossing opportunities in the vicinity of the site. There are no other significant geographic feature constraints in the	The City is bisected by the Otonabee River and there are a limited number of crossing opportunities in the vicinity of the site. There are no other significant geographic feature constraints in the	The City is bisected by the Otonabee River and there are a limited number of crossing opportunities in the vicinity of the site. There are no other significant geographic feature constraints in the	The City is bisected by the Otonabee River and there are a limited number of crossing opportunities in the vicinity of the site. There are no other significant geographic feature constraints in the

Criteria [Priority]	Indicator Priority	Indicator	Station 4 – Ashburnham Location with Station 2 Potential Location					Station 4 – Parkhill Location with Station 2 Potential Location				
			Dennistoun	Northcrest	Towerhill	Sunset	Heritage	Dennistoun	Northcrest	Towerhill	Sunset	Heritage
			vicinity of the site. With Station 4 located on the east side of the river the risk of one of the limited crossing opportunities being blocked is partially mitigated.	vicinity of the site. With Station 4 located on the east side of the river the risk of one of the limited crossing opportunities being blocked is partially mitigated.	vicinity of the site. With Station 4 located on the east side of the river the risk of one of the limited crossing opportunities being blocked is partially mitigated.	vicinity of the site. With Station 4 located on the east side of the river the risk of one of the limited crossing opportunities being blocked is partially mitigated.	vicinity of the site. With Station 4 located on the east side of the river the risk of one of the limited crossing opportunities being blocked is partially mitigated.	vicinity of the site.	vicinity of the site.	vicinity of the site.	vicinity of the site.	vicinity of the site.
	High	% of existing residential land uses covered by 4 FF within 4 min of travel time	48.0%	49.8%	50.4%	52.3%	45.8%	52.1%	54.3%	55.2%	56.1%	50.2%
	High	% of existing residential land uses covered by 8 FF within 6 min of travel time	49.9%	46.3%	47.4%	48.7%	40.7%	50.8%	41.3%	40.4%	46.0%	37.0%
	High	% of existing residential land uses covered by 16 FF within 8 min of travel time	20.2%	9.7%	13.5%	17.9%	3.9%	24.2%	11.9%	22.2%	24.8%	4.7%
Cost [High]	High	Land cost	0	0	$350,000	0	$2,000,000	0	0	$350,000	0	$2,000,000
	High	Servicing Cost	$600,000	$600,000	$3,500,000	$600,000	$600,000	$600,000	$600,000	$3,500,000	$600,000	$600,000

			Station 4 – Ashburnham Location with Station 2 Potential Location					Station 4 – Parkhill Location with Station 2 Potential Location				
Criteria [Priority]	Indicator Priority	Indicator	Dennistoun	Northcrest	Towerhill	Sunset	Heritage	Dennistoun	Northcrest	Towerhill	Sunset	Heritage
	High	Estimated Design / Construction Costs	$8,500,000	$8,500,000	$8,500,000	$8,500,000	$8,500,000	$8,500,000	$8,500,000	$8,500,000	$8,500,000	$8,500,000
	Low	Portion of Site to be Used	Up to 2 Acres	Up to 2 Acres	Up to 2 Acres	Up to 2 Acres	2.14 Acres	Up to 2 Acres	Up to 2 Acres	Up to 2 Acres	Up to 2 Acres	2.14 Acres
	Medium	Ownership	City of Peterborough	City of Peterborough	Privately Owned to be Acquired	City of Peterborough	Privately Owned to be Acquired	City of Peterborough	City of Peterborough	Privately Owned to be Acquired	City of Peterborough	Privately Owned to be Acquired
Site Characteristics [Medium]	High	Site Accessibility to/from road network	Access onto a Medium Capacity Arterial with good connectivity to the rest of the arterial road network, including the bridge crossing to east side of Otonabee River.	Access onto a High Capacity Collector with good connectivity to the arterial road network.	Access onto a High Capacity Arterial road with good connectivity to the arterial road network.	Access onto a Low Capacity Collector with good connectivity to the arterial road network.	Access onto a Medium Capacity Arterial with good connectivity to the arterial road network.	Access onto a Medium Capacity Arterial with good connectivity to the rest of the arterial road network, including the bridge crossing to east side of Otonabee River.	Access onto a High Capacity Collector with good connectivity to the arterial road network.	Access onto a High Capacity Arterial road with good connectivity to the arterial road network.	Access onto a Low Capacity Collector with good connectivity to the arterial road network.	Access onto a Medium Capacity Arterial with good connectivity to the arterial road network.
	High	Site Constraints / Concerns	Archaeological potential to be considered.	Existing trees at the north of property would require a scoped environmental study on the woodlot, may lead to a setback requirement. Demolition and decommissioning of the existing Arena building to be considered.	Significant grading required, future road widening reconstruction.	Archaeological potential to be considered. Stormwater management ponds have been planned for the site; however, it is anticipated that the site can also accommodate a fire station.	Potential conflict with median to be considered on Heritage. Accommodation of an existing trail adjacent to the site would need to be considered.	Archaeological potential to be considered.	Existing trees at the north of property would require a scoped environmental study on the woodlot, may lead to a setback requirement. Demolition and decommissioning of the existing Arena building to be considered.	Significant grading required, future road widening reconstruction.	Archaeological potential to be considered. Stormwater management ponds have been planned for the site; however, it is anticipated that the site can also accommodate a fire station.	Potential conflict with median to be considered on Heritage. Accommodation of an existing trail adjacent to the site would need to be considered.

			Station 4 – Ashburnham Location with Station 2 Potential Location					Station 4 – Parkhill Location with Station 2 Potential Location				
Criteria [Priority]	Indicator Priority	Indicator	Dennistoun	Northcrest	Towerhill	Sunset	Heritage	Dennistoun	Northcrest	Towerhill	Sunset	Heritage
Land Use [Low]	Low	Permitting / Process Requirements	Site plan approval required. ORCA permit not required.	Site plan approval required. ORCA permit not required.	Site plan approval required. ORCA permit not required.	Site plan approval required. ORCA permit required.	Site plan approval required. ORCA permit not required.	Site plan approval required. ORCA permit not required.	Site plan approval required. ORCA permit not required.	Site plan approval required. ORCA permit not required.	Site plan approval required. ORCA permit required.	Site plan approval required. ORCA permit not required.
	Medium	Compatibility with Surrounding Neighbourhood	Mixed residential densities combined with light commercial.	Medium density residential combined with light commercial.	Lower density residential combined with light commercial.	Primarily a commercial area with residential. Neighbourhood has anticipated the potential for the Parkway in this location.	Medium density residential, with buffering to the north and east due to Major Open Space feature.	Mixed residential densities combined with light commercial.	Medium density residential combined with light commercial.	Lower density residential combined with light commercial.	Primarily a commercial area with residential. Neighbourhood has anticipated the potential for the Parkway in this location.	Medium density residential, with buffering to the north and east due to Major Open Space feature.

Appendix B

Criterion Ranking Summary

			Station 4 – Ashburnham Location with Station 2 Potential Location					Station 4 – Parkhill Location with Station 2 Potential Location				
Criteria [Priority]	Indicator Priority	Indicator	Dennistoun	Northcrest	Towerhill	Sunset	Heritage	Dennistoun	Northcrest	Towerhill	Sunset	Heritage
Initial Arriving Company (4 FF arriving in 4 minutes of travel time) [High]	High	% Historic Calls Covered	5	3	8	2	10	6	1	9	4	7
	High	% Municipal Area Covered	5	2	3	1	8	9	6	6	4	10
	High	% Road Length Covered	7	1	4	2	8	9	3	6	5	10
Second Arriving Company (8 FF arriving in 6 minutes of travel time) [Medium]	High	% Historic Calls Covered	1	5	4	2	8	2	7	9	6	10
	High	% Municipal Area Covered	1	5	4	3	7	2	8	9	6	10
	High	% Road Length Covered	2	5	4	3	8	1	7	9	6	10
Single-Family Dwelling Initial Full Alarm Assignment (16 FF arriving in 8 minutes of travel time) [Low]	High	% Historic Calls Covered	2	8	6	4	10	3	7	5	1	9
	High	% Municipal Area Covered	3	8	6	5	10	2	7	4	1	9
	High	% Road Length Covered	3	8	6	5	10	2	7	4	1	9
Risk [High]	High	Geographical Features Nearby	1	1	1	1	1	6	6	6	6	6
	High	% of existing residential land uses covered by 4 FF within 4 min of travel time	9	8	6	4	10	5	3	2	1	7
		Rank	9	8	6	4	10	5	3	2	1	7
	High	% of existing residential	2	5	4	3	8	1	7	9	6	10

			Station 4 – Ashburnham Location with Station 2 Potential Location					Station 4 – Parkhill Location with Station 2 Potential Location				
Criteria [Priority]	Indicator Priority	Indicator	Dennistoun	Northcrest	Towerhill	Sunset	Heritage	Dennistoun	Northcrest	Towerhill	Sunset	Heritage
		land uses covered by 8 FF within 6 min of travel time										
	High	% of existing residential land uses covered by 16 FF within 8 min of travel time	4	8	6	5	10	2	7	3	1	9
Cost [High]	High	Land cost	1	1	7	1	9	1	1	7	1	9
	High	Servicing Cost	1	1	8	1	1	1	1	8	1	1
	High	Estimated Design / Construction Costs	1	1	1	1	1	1	1	1	1	1
Site Characteristics [Medium]	Low	Portion of Site to be Used	1	1	1	1	1	1	1	1	1	1
	Medium	Ownership	1	1	7	1	7	1	1	7	1	7
	High	Site Accessibility to/from road network	1	1	1	1	1	1	1	1	1	1
	High	Site Constraints / Concerns	5	5	1	5	1	5	5	1	5	1
Land Use [Low]	Low	Permitting / Process Requirements	1	1	1	9	1	1	1	1	9	1

			Station 4 – Ashburnham Location with Station 2 Potential Location					Station 4 – Parkhill Location with Station 2 Potential Location				
Criteria [Priority]	Indicator Priority	Indicator	Dennistoun	Northcrest	Towerhill	Sunset	Heritage	Dennistoun	Northcrest	Towerhill	Sunset	Heritage
	Medium	Compatibility with Surrounding Neighbourhood	7	7	3	1	3	7	7	3	1	3

Appendix C

Pairwise Comparison by Criterion

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Initial Arriving Company - Evaluation

Station 4 Options				Ashburnham					Parkhill				
Station 2 Options				Dennistoun	Northcrest	Towerhill	Sunset	Heritage	Dennistoun	Northcrest	Towerhill	Sunset	Heritage
Criteria (Criteria Priority)	Indicator	Indicator Priority	Data	DA	NA	TA	SA	HA	DP	NP	TP	SP	HP
Initial Arriving Company (High)	% Historic Calls Covered	High	Coverage	80.4%	81.1%	76.3%	81.5%	75.9%	80.2%	81.7%	76.1%	81.0%	76.5%
			Rank	5	3	8	2	10	6	1	9	4	7
	% Municipal Area Covered	High	Coverage	48.5%	49.7%	49.6%	51.1%	48.1%	47.1%	48.4%	48.4%	49.0%	46.7%
			Rank	5	2	3	1	8	9	6	6	4	10
	% Road Length Covered	High	Coverage	54.3%	57.5%	56.2%	56.9%	54.2%	53.8%	56.7%	55.7%	55.9%	53.7%
			Rank	7	1	4	2	8	9	3	6	5	10

Initial Arriving Company - Paired Comparison Analysis

DA vs NA	DA vs TA	DA vs SA	DA vs HA	DA vs DP	DA vs NP	DA vs TP	DA vs SP	DA vs HP
NA (3-0)	TA (2-1)	SA (3-0)	DA (3-0)	DA (3-0)	NP (2-1)	DA (2-1)	SP (3-0)	DA (3-0)

NA vs TA	NA vs SA	NA vs HA	NA vs DP	NA vs NP	NA vs TP	NA vs SP	NA vs HP
NA (3-0)	SA (2-1)	NA (3-0)	NA (3-0)	NA (2-1)	NA (3-0)	NA (3-0)	NA (3-0)

TA vs SA	TA vs HA	TA vs DP	TA vs NP	TA vs TP	TA vs SP	TA vs HP
SA (3-0)	TA (3-0)	TA (2-1)	NP (2-1)	TA (3-0)	TA (2-1)	TA (2-1)

SA vs HA	SA vs DP	SA vs NP	SA vs TP	SA vs SP	SA vs HP
SA (3-0)	SA (3-0)	SA (2-1)	SA (3-0)	SA (3-0)	SA (3-0)

HA vs DP	HA vs NP	HA vs TP	HA vs SP	HA vs HP
HA (2-1)	NP (3-0)	TP (3-0)	SP (3-0)	HA (2-1)

DP vs NP	DP vs TP	DP vs SP	DP vs HP
NP (3-0)	TP (2-1)	SP (3-0)	DP (3-0)

NP vs TP	NP vs SP	NP vs HP
NP (3-1)	NP (2-1)	NP (3-0)

TP vs SP	TP vs HP
SP (3-0)	TP (2-1)

SP vs HP
SP (3-0)

Initial Arriving Company - Ranking Results

Station Option	Paired Comparison Wins	Criterion Rank
DA	4	6
NA	8	2
TA	6	4
SA	9	1
HA	2	8
DP	1	9
NP	7	3
TP	3	7
SP	5	5
HP	0	10
	45	

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Second Arriving Company - Evaluation

Station 4 Options				Ashburnham					Parkhill				
Station 2 Options				Dennistoun	Northcrest	Towerhill	Sunset	Heritage	Dennistoun	Northcrest	Towerhill	Sunset	Heritage
Criteria (Criteria Priority)	Indicator	Indicator Priority	Data	DA	NA	TA	SA	HA	DP	NP	TP	SP	HP
Second Arriving Company - 8 FF arriving in 6 minutes of travel time (Medium)	% Historic Calls Covered	High	Coverage	78.1%	76.9%	77.2%	78.0%	69.8%	78.0%	73.0%	68.7%	76.7%	62.7%
			Rank	1	5	4	2	8	2	7	9	6	10
	% Municipal Area Covered	High	Coverage	41.9%	39.1%	39.7%	41.0%	35.2%	41.2%	32.6%	31.8%	37.2%	28.8%
			Rank	1	5	4	3	7	2	8	9	6	10
	% Road Length Covered	High	Coverage	51.7%	49.9%	50.4%	51.1%	44.2%	52.8%	45.4%	43.6%	49.1%	40.8%
			Rank	2	5	4	3	8	1	7	9	6	10

Second Arriving Company - Paired Comparison Analysis

DA vs NA	DA vs TA	DA vs SA	DA vs HA	DA vs DP	DA vs NP	DA vs TP	DA vs SP	DA vs HP
DA (3-0)	DA (3-0)	DA (3-0)	DA (3-0)	DA (2-1)	DA (3-0)	DA (3-0)	DA (3-0)	DA (3-0)

NA vs TA	NA vs SA	NA vs HA	NA vs DP	NA vs NP	NA vs TP	NA vs SP	NA vs HP
TA (3-0)	SA (3-0)	NA (3-0)	DP (3-0)	NA (3-0)	NA (3-0)	NA (3-0)	NA (3-0)

TA vs SA	TA vs HA	TA vs DP	TA vs NP	TA vs TP	TA vs SP	TA vs HP
SA (3-0)	TA (3-0)	DP (3-0)	TA (3-0)	TA (3-0)	TA (3-0)	TA (3-0)

SA vs HA	SA vs DP	SA vs NP	SA vs TP	SA vs SP	SA vs HP
SA (3-0)	DP (3-1)	SA (3-0)	SA (3-0)	SA (3-0)	SA (3-0)

HA vs DP	HA vs NP	HA vs TP	HA vs SP	HA vs HP
DP (3-0)	NP (2-1)	HA (3-0)	SP (3-0)	HA (3-0)

DP vs NP	DP vs TP	DP vs SP	DP vs HP
DP (3-0)	DP (3-0)	DP (3-0)	DP (3-0)

NP vs TP	NP vs SP	NP vs HP
NP (3-0)	SP (3-0)	NP (3-0)

TP vs SP	TP vs HP
SP (3-0)	TP (3-0)

SP vs HP
SP (3-0)

Second Arriving Company - Ranking Results

Station Option	Paired Comparison Wins	Criterion Rank
DA	9	1
NA	5	5
TA	6	4
SA	7	3
HA	2	8
DP	8	2
NP	3	7
TP	1	9
SP	4	6
HP	0	10
	45	

Single-Family Dwelling Initial Full Alarm Assignment - Evaluation

Station 4 Options				Ashburnham					Parkhill				
Station 2 Options				Dennistoun	Northcrest	Towerhill	Sunset	Heritage	Dennistoun	Northcrest	Towerhill	Sunset	Heritage
Criteria (Criteria Priority)	Indicator	Indicator Priority	Data	DA	NA	TA	SA	HA	DP	NP	TP	SP	HP
Single-Family Dwelling Initial Full Alarm Assignment - 16 FF arriving in 8 minutes of travel time (Low)	% Historic Calls Covered	High	Coverage	52.8%	35.9%	44.2%	50.9%	14.0%	52.7%	36.6%	49.3%	53.7%	14.7%
			Rank	2	8	6	4	10	3	7	5	1	9
	% Municipal Area Covered	High	Coverage	17.1%	7.7%	10.8%	15.2%	2.8%	18.0%	9.0%	16.0%	18.4%	3.3%
			Rank	3	8	6	5	10	2	7	4	1	9
	% Road Length Covered	High	Coverage	26.8%	14.7%	19.3%	24.8%	6.1%	27.6%	16.1%	25.3%	28.0%	6.8%
			Rank	3	8	6	5	10	2	7	4	1	9

Single-Family Dwelling Initial Full Alarm Assignmen - Paired Comparison Analysis

DA vs NA	DA vs TA	DA vs SA	DA vs HA	DA vs DP	DA vs NP	DA vs TP	DA vs SP	DA vs HP
DA (3-0)	DA (3-0)	DA (3-0)	DA (3-0)	DP (2-1)	DA (3-0)	DA (3-0)	SP (3-0)	DA (3-0)

NA vs TA	NA vs SA	NA vs HA	NA vs DP	NA vs NP	NA vs TP	NA vs SP	NA vs HP
TA (3-0)	SA (3-0)	NA (3-0)	DP (3-0)	NP (3-0)	TP (3-0)	SP (3-0)	NA (3-0)

TA vs SA	TA vs HA	TA vs DP	TA vs NP	TA vs TP	TA vs SP	TA vs HP
SA (3-0)	TA (3-0)	DP (3-0)	TA (3-0)	TP (3-0)	SP (3-0)	TA (3-0)

SA vs HA	SA vs DP	SA vs NP	SA vs TP	SA vs SP	SA vs HP
SA (3-0)	DP (3-0)	SA (3-0)	TP (2-1)	SP (3-0)	SA (3-0)

HA vs DP	HA vs NP	HA vs TP	HA vs SP	HA vs HP
DP (3-0)	NP (3-0)	TP (3-0)	SP (3-0)	HP (3-0)

DP vs NP	DP vs TP	DP vs SP	DP vs HP
DP (3-0)	DP (3-0)	SP (3-0)	DP (3-0)

NP vs TP	NP vs SP	NP vs HP
TP (3-0)	SP (3-0)	NP (3-0)

TP vs SP	TP vs HP
SP (3-0)	TP (3-0)

SP vs HP
SP (3-0)

Single-Family Dwelling Initial Full Alarm Assignment - Ranked Results

Station Option	Paired Comparison Wins	Criterion Rank
DA	7	3
NA	2	8
TA	4	6
SA	5	5
HA	0	10
DP	8	2
NP	3	7
TP	6	4
SP	9	1
HP	1	9
	45	

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Risk - Evaluation

Station 4 Options				Ashburnham					Parkhill				
Station 2 Options				Dennistoun	Northcrest	Towerhill	Sunset	Heritage	Dennistoun	Northcrest	Towerhill	Sunset	Heritage
Criteria (Criteria Priority)	Indicator	Indicator Priority	Data	DA	NA	TA	SA	HA	DP	NP	TP	SP	HP
Risk (High)	Geographical Features Nearby	High	Rank	1	1	1	1	1	6	6	6	6	6
	% of existing residential land uses covered by 4 FF within 4 min of travel time	High	Coverage	48.0%	49.8%	50.4%	52.3%	45.8%	52.1%	54.3%	55.2%	56.1%	50.2%
			Rank	9	8	6	4	10	5	3	2	1	7
	% of existing residential land uses covered by 8 FF within 6 min of travel time	High	Coverage	49.9%	46.3%	47.4%	48.7%	40.7%	50.8%	41.3%	40.4%	46.0%	37.0%
			Rank	2	5	4	3	8	1	7	9	6	10
	% of existing residential land uses covered by 16 FF within 8 min of travel time	High	Coverage	20.2%	9.7%	13.5%	17.9%	3.9%	24.2%	11.9%	22.2%	24.8%	4.7%
			Rank	4	8	6	5	10	2	7	3	1	9

TIE Yellow highlighted cells indicate a tie between station options.

Risk - Paired Comparison Analysis

DA vs NA	DA vs TA	DA vs SA	DA vs HA	DA vs DP	DA vs NP	DA vs TP	DA vs SP	DA vs HP
DA (3-2)	DA (3-2)	DA (3-2)	DA (4-1)	DP (3-1)	DA (3-1)	DA/TP (2-2)	DA/SP (2-2)	DA (3-1)

NA vs TA	NA vs SA	NA vs HA	NA vs DP	NA vs NP	NA vs TP	NA vs SP	NA vs HP
TA (4-1)	SA (4-1)	NA (4-1)	DP (3-1)	NA/NP (2-2)	NA/TP (2-2)	NA/SP (2-2)	NA (3-1)

TA vs SA	TA vs HA	TA vs DP	TA vs NP	TA vs TP	TA vs SP	TA vs HP
SA (4-1)	TA (4-1)	DP (3-1)	TA (3-1)	TA/TP (2-2)	TA/SP (2-2)	TA (4-0)

SA vs HA	SA vs DP	SA vs NP	SA vs TP	SA vs SP	SA vs HP
SA (4-1)	SA/DP (2-2)	SA (3-1)	SA/TP (2-2)	SA/SP (2-2)	SA (4-0)

HA vs DP	HA vs NP	HA vs TP	HA vs SP	HA vs HP
DP (3-1)	NP (3-1)	HA/TP (2-2)	SP (3-1)	HA/HP (2-2)

DP vs NP	DP vs TP	DP vs SP	DP vs HP
DP (3-2)	DP (3-2)	SP (3-2)	DP (4-1)

NP vs TP	NP vs SP	NP vs HP
TP (3-2)	SP (4-1)	NP (4-1)

TP vs SP	TP vs HP
SP (4-1)	TP (4-1)

SP vs HP
SP (4-1)

Risk - Ranked Results

Station Option	Paired Comparison Wins*	Criterion Rank
DA	7	2
NA	3.5	7
TA	5	5
SA	6.5	4
HA	1	9
DP	7.5	1
NP	2.5	8
TP	4.5	6
SP	7	2
HP	0.5	10
	45	

*Half points were given in the event of a tie

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Appendix C - Pairwise Comparison by Criterion
City of Peterborough
Fire Station 2 Location Review
June 2020 - 18-8071

Cost - Evaluation

Station 4 Options				Ashburnham					Parkhill				
Station 2 Options				Dennistoun	Northcrest	Towerhill	Sunset	Heritage	Dennistoun	Northcrest	Towerhill	Sunset	Heritage
Criteria (Criteria Priority)	Indicator	Indicator Priority	Data	DA	NA	TA	SA	HA	DP	NP	TP	SP	HP
Cost (High)	Land cost	High	Results	$0	$0	$350,000	$0	$2,000,000	$0	$0	$350,000	$0	$2,000,000
			Rank	1	1	7	1	9	1	1	7	1	9
	Servicing Cost	High	Results	$600,000	$600,000	$3,500,000	$600,000	$600,000	$600,000	$600,000	$3,500,000	$600,000	$600,000
			Rank	1	1	8	1	1	1	1	8	1	1
	Estimated Design / Construction Costs	High	Results	$8,500,000	$8,500,000	$8,500,000	$8,500,000	$8,500,000	$8,500,000	$8,500,000	$8,500,000	$8,500,000	$8,500,000
			Rank	1	1	1	1	1	1	1	1	1	1

One indicator (Estimated Design / Construction Cost) has the same ranking (1) for each site.
This indicator was therefore not included in the paired comparison analysis for the Cost criterion.
TIE Yellow highlighted cells indicate a tie between station options.

Paired Comparison Data Table

DA vs NA	DA vs TA	DA vs SA	DA vs HA	DA vs DP	DA vs NP	DA vs TP	DA vs SP	DA vs HP
DA/NA (1-1)	DA (2-0)	DA/SA (1-1)	DA(2-1)	DA/DP (1-1)	DA/NP (1-1)	DA (2-0)	DA/SP (1-1)	DA (2-1)

NA vs TA	NA vs SA	NA vs HA	NA vs DP	NA vs NP	NA vs TP	NA vs SP	NA vs HP
NA (2-0)	NA/SA (1-1)	NA (2-1)	NA/DP (1-1)	NA/NP (1-1)	NA (2-0)	NA/SP (1-1)	NA (2-1)

TA vs SA	TA vs HA	TA vs DP	TA vs NP	TA vs TP	TA vs SP	TA vs HP
SA (2-0)	TA/HA (1-1)	DP (2-0)	NP (2-0)	TA/TP (1-1)	SP (2-0)	TA/HP (1-1)

SA vs HA	SA vs DP	SA vs NP	SA vs TP	SA vs SP	SA vs HP
SA (2-1)	SA/DP (1-1)	SA/NP (1-1)	SA (2-0)	SA/SP (1-1)	SA (2-1)

HA vs DP	HA vs NP	HA vs TP	HA vs SP	HA vs HP
DP (2-1)	NP (2-1)	HA/TP (1-1)	SP (2-1)	HA/HP (1-1)

DP vs NP	DP vs TP	DP vs SP	DP vs HP
DP/NP (1-1)	DP (2-0)	DP/SP (1-1)	DP (2-1)

NP vs TP	NP vs SP	NP vs HP
NP (2-0)	NP/SP (1-1)	NP (2-1)

TP vs SP	TP vs HP
SP (2-0)	TP/HP (1-1)

SP vs HP
SP (2-1)

Cost - Ranked Results

Station Option	Paired Comparison Wins*	Criterion Rank
DA	6.5	1
NA	6.5	1
TA	1.5	7
SA	6.5	1
HA	1.5	7
DP	6.5	1
NP	6.5	1
TP	1.5	7
SP	6.5	1
HP	1.5	7

*Half point were given in the event of a tie

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Site Characteristics - Evaluation

Station 4 Options				Ashburnham					Parkhill				
Station 2 Options				Dennistoun	Northcrest	Towerhill	Sunset	Heritage	Dennistoun	Northcrest	Towerhill	Sunset	Heritage
Criteria (Criteria Priority)	Indicator	Indicator Priority	Data	DA	NA	TA	SA	HA	DP	NP	TP	SP	HP
Site Characteristics (Medium)	Portion of Site to be Used	Low	Results	Up to 2 Acres	Up to 2 Acres	Up to 2 Acres	Up to 2 Acres	2.14 Acres	Up to 2 Acres	Up to 2 Acres	Up to 2 Acres	Up to 2 Acres	2.14 Acres
			Rank	1	1	1	1	1	1	1	1	1	1
	Ownership	Medium	Results	City of Peterborough	City of Peterborough	Privately Owned to be Acquired	City of Peterborough	Privately Owned to be Acquired	City of Peterborough	City of Peterborough	Privately Owned to be Acquired	City of Peterborough	Privately Owned to be Acquired
			Rank	1	1	7	1	7	1	1	7	1	7
	Site Accessibility to/from road network	High	Results	Access onto a Medium Capacity Arterial with good connectivity to the rest of the arterial road network, including the bridge crossing to east side of Otonabee River.	Access onto a High Capacity Collector with good connectivity to the arterial road network.	Access onto a High Capacity Arterial road with good connectivity to the arterial road network.	Access onto a Low Capacity Collector with good connectivity to the arterial road network.	Access onto a Medium Capacity Arterial with good connectivity to the arterial road network.	Access onto a Medium Capacity Arterial with good connectivity to the rest of the arterial road network, including the bridge crossing to east side of Otonabee River.	Access onto a High Capacity Collector with good connectivity to the arterial road network.	Access onto a High Capacity Arterial road with good connectivity to the arterial road network.	Access onto a Low Capacity Collector with good connectivity to the arterial road network.	Access onto a Medium Capacity Arterial with good connectivity to the arterial road network.
			Rank	1	1	1	1	1	1	1	1	1	1
	Site Constraints / Concerns	High	Results	Archaeological potential to be considered.	Existing trees at the north of property would require a scoped environmental study on the woodlot, may lead to a setback requirement. Demolition and decommissioning of the existing Arena building to be considered .	Significant grading required, future road widening reconstruction.	Archaeological potential to be considered. Stormwater management ponds have been planned for the site; however, it is anticipated that the site can also accommodate a fire station.	Potential conflict with median to be considered on Heritage. Accommodation of an existing trail adjacent to the site would need to be considered.	Archaeological potential to be considered.	Existing trees at the north of property would require a scoped environmental study on the woodlot, may lead to a setback requirement. Demolition and decommissioning of the existing Arena building to be considered	Significant grading required, future road widening reconstruction.	Archaeological potential to be considered. Stormwater management ponds have been planned for the site; however, it is anticipated that the site can also accommodate a fire station.	Potential conflict with median to be considered on Heritage. Accommodation of an existing trail adjacent to the site would need to be considered.
			Rank	5	5	1	5	1	5	5	1	5	1

Two indicators (Portion of Site to be Used and Site Accessibility to/from Road Network) had the same ranking (1) for each site.
These indicators were therefore not included in the paired comparison analysis for the Site Characteristics criterion.

TIE Yellow highlighted cells indicate a tie between station options.

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Site Characteristics - Paired Comparison Analysis

	Medium	High	Results
DA vs NA	TIE	TIE	TIE
DA vs TA	DA	TA	TA
DA vs SA	TIE	TIE	TIE
DA vs HA	DA	HA	HA
DA vs DP	TIE	TIE	TIE
DA vs NP	TIE	TIE	TIE
DA vs TP	DA	TP	TP
DA vs SP	TIE	TIE	TIE
DA vs HP	DA	HP	HP
NA vs TA	NA	TA	TA
NA vs SA	TIE	TIE	TIE
NA vs HA	NA	HA	HA
NA vs DP	TIE	TIE	TIE
NA vs NP	TIE	TIE	TIE
NA vs TP	NA	TP	TP
NA vs SP	TIE	TIE	TIE
NA vs HP	NA	HP	HP
TA vs SA	SA	TA	TA
TA vs HA	TIE	TIE	TIE
TA vs DP	DP	TA	TA
TA vs NP	NP	TA	TA
TA vs TP	TIE	TIE	TIE
TA vs SP	SP	TA	TA
TA vs HP	TIE	TIE	TIE
SA vs HA	SA	HA	HA
SA vs DP	TIE	TIE	TIE
SA vs NP	TIE	TIE	TIE
SA vs TP	SA	TP	TP
SA vs SP	TIE	TIE	TIE
SA vs HP	SA	HP	HP
HA vs DP	DP	HA	HA
HA vs NP	NP	HA	HA
HA vs TP	TIE	TIE	TIE
HA vs SP	SP	HA	HA
HA vs HP	TIE	TIE	TIE
DP vs NP	TIE	TIE	TIE
DP vs TP	DP	TP	TP
DP vs SP	TIE	TIE	TIE
DP vs HP	DP	HP	HP
NP vs TP	NP	TP	TP
NP vs SP	TIE	TIE	TIE
NP vs HP	NP	HP	HP
TP vs SP	SP	TP	TP
TP vs HP	TIE	TIE	TIE
SP vs HP	SP	HP	HP

Site Characteristics - Ranked Results

Station Option	Paired Comparison Wins*	Criterion Rank
DA	2.5	5
NA	2.5	5
TA	7.5	1
SA	2.5	5
HA	7.5	1
DP	2.5	5
NP	2.5	5
TP	7.5	1
SP	2.5	5
HP	7.5	1

*Half points were given in the event of a tie

Land Use - Evaluation

Station 4 Options				Ashburnham					Parkhill				
Station 2 Options				Dennistoun	Northcrest	Towerhill	Sunset	Heritage	Dennistoun	Northcrest	Towerhill	Sunset	Heritage
Criteria (Criteria Priority)	Indicator	Indicator Priority	Data	DA	NA	TA	SA	HA	DP	NP	TP	SP	HP
Land Use (Low)	Permitting / Process Requirements	Low	Results	Site plan approval required. ORCA permit not required.	Site plan approval required. ORCA permit not required.	Site plan approval required. ORCA permit not required.	Site plan approval required. ORCA permit required.	Site plan approval required. ORCA permit not required.	Site plan approval required. ORCA permit not required.	Site plan approval required. ORCA permit not required.	Site plan approval required. ORCA permit not required.	Site plan approval required. ORCA permit required.	Site plan approval required. ORCA permit not required.
			Rank	1	1	1	9	1	1	1	1	9	1
	Compatibility with Surrounding Neighbourhood	Medium	Results	Mixed residential densities combined with light commercial.	Medium density residential combined with light commercial.	Lower density residential combined with light commercial.	Primarily a commercial area with residential. Neighbourhood has anticipated the potential for the Parkway in this location.	Medium density residential, with buffering to the north and east due to Major Open Space feature.	Mixed residential densities combined with light commercial.	Medium density residential combined with light commercial.	Lower density residential combined with light commercial.	Primarily a commercial area with residential. Neighbourhood has anticipated the potential for the Parkway in this location.	Medium density residential, with buffering to the north and east due to Major Open Space feature.
			Rank	7	7	3	1	3	7	7	3	1	3

TIE Yellow highlighted cells indicate a tie between station options.

Land Use - Paired Comparison Analysis

	Low	Medium	Results
DA vs NA	TIE	TIE	TIE
DA vs TA	TIE	TA	TA
DA vs SA	DA	SA	SA
DA vs HA	TIE	HA	HA
DA vs DP	TIE	TIE	TIE
DA vs NP	TIE	TIE	TIE
DA vs TP	TIE	TP	TP
DA vs SP	DA	SP	SP
DA vs HP	TIE	HP	HP
NA vs TA	TIE	TA	TA
NA vs SA	NA	SA	SA
NA vs HA	TIE	HA	HA
NA vs DP	TIE	TIE	TIE
NA vs NP	TIE	TIE	TIE
NA vs TP	TIE	TP	TP
NA vs SP	NA	SP	SP
NA vs HP	TIE	HP	HP
TA vs SA	TA	SA	SA
TA vs HA	TIE	TIE	TIE
TA vs DP	TIE	TA	TA
TA vs NP	TIE	TA	TA
TA vs TP	TIE	TIE	TIE
TA vs SP	TA	SP	SP
TA vs HP	TIE	TIE	TIE
SA vs HA	HA	SA	SA
SA vs DP	DP	SA	SA
SA vs NP	NP	SA	SA
SA vs TP	TP	SA	SA
SA vs SP	TIE	TIE	TIE
SA vs HP	HP	SA	SA
HA vs DP	TIE	HA	HA
HA vs NP	TIE	HA	HA
HA vs TP	TIE	TIE	TIE
HA vs SP	HA	SP	SP
HA vs HP	TIE	TIE	TIE
DP vs NP	TIE	TIE	TIE
DP vs TP	TIE	TP	TP
DP vs SP	DP	SP	SP
DP vs HP	TIE	HP	HP
NP vs TP	TIE	TP	TP
NP vs SP	NP	SP	SP
NP vs HP	TIE	HP	HP
TP vs SP	TP	SP	SP
TP vs HP	TIE	TIE	TIE
SP vs HP	HP	SP	SP

Land Use - Ranked Results

Station Option	Paired Comparison Wins*	Criterion Rank
DA	1.5	7
NA	1.5	7
TA	5.5	3
SA	8.5	1
HA	5.5	3
DP	1.5	7
NP	1.5	7
TP	5.5	3
SP	8.5	1
HP	5.5	3

*Half points were given in the event of a tie

Appendix D

Initial Arriving Company Modelling – Ashburnham Four Station Model

DILLON CONSULTING

Initial Arriving Company Dennistoun & Ashburnham

4 Firefighters in 4 Minutes of Travel Time	
% Historic Calls Covered	80.4%
% Municipal Area Covered	48.5%
% Road Length Covered	54.3%

Legend

- 4 — Potential Ashburnham Dr Location
- 2 — Potential Dennistoun Location
- 1 — Existing Fire Station 1
- 3 — Existing Fire Station 3

Streets

- Existing Street
- Proposed Future Street

Coverage in Minutes

- 0 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- City Limit

Potential Dennistoun Location

Potential Ashburnham Location

Little Lake

Woodland Dr, Pioneer Rd, Armour Rd, Carnegie Av, University Rd, Cumberland Av, Water St, Armour Rd, Towerhill Rd, Chemong Rd, Hilliard St, Lily Lake Rd, Fairbairn St, Parkhill Rd E, Parkhill Rd W, McDonnel St, Reid St, George St N, Aylmer St N, Medical Dr, Rubidge St, Charlotte St, Hunter St E, Maria St, Ashburnham Dr, Sherbrooke St, Park St N, Monaghan Rd, Clonsilla Av, Aylmer St S, George St S, Park St S, Lansdowne St E, Lansdowne St W, River Rd S, Breeley Dr, The Queensway, The Parkway, Crawford Dr, Johnston Dr, Kennedy Rd, Bensfort Rd, Airport Rd, 115

peterborough

Kilometers

0.50.25 0 0.5 1 1.5 2

June, 2020

Produced by Geomatics/Mapping, City of Peterborough

Initial Arriving Company
Northcrest & Ashburnham

4 Firefighters in 4 Minutes of Travel Time	
% Historic Calls Covered	81.1%
% Municipal Area Covered	49.7%
% Road Length Covered	57.5%

Legend

- 2 — Potential Northcrest Location
- 4 — Potential Ashburnham Dr Location
- 1 — Existing Fire Station 1
- 3 — Existing Fire Station 3

Streets

- Existing Street
- Proposed Future Street

Coverage in Minutes

- 4 min
- 6 min
- 8 min
- 10 min
- City Limit

Potential Northcrest Location

Potential Ashburnham Location

Little Lake

peterborough

Kilometers

0.50.25 0 0.5 1 1.5 2

June, 2020

Produced by Geomatics/Mapping, City of Peterborough

Initial Arriving Company
Towerhill & Ashburnham

4 Firefighters in 4 Minutes of Travel Time	
% Historic Calls Covered	76.3%
% Municipal Area Covered	49.6%
% Road Length Covered	56.2%

Legend

- 4 — Potential Ashburnham Dr Location
- 1 — Existing Fire Station 1
- 3 — Existing Fire Station 3

Streets

- Existing Street
- Proposed Future Street

Coverage in Minutes

- 0 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- City Limit

Potential Towerhill Location

Potential Ashburnham Location

N

Kilometers

0.5 0.25 0 0.5 1 1.5 2

June, 2020

Produced by Geomatics/Mapping, City of Peterborough

peterborough

Initial Arriving Company
Sunset/Chemong & Ashburnham

4 Firefighters in 4 Minutes of Travel Time	
% Historic Calls Covered	81.5%
% Municipal Area Covered	51.1%
% Road Length Covered	56.9%

Legend

- 2 — Potential Sunset & Chemong Location
- 4 — Potential Ashburnham Dr Location
- 1 — Existing Fire Station 1
- 3 — Existing Fire Station 3

Streets

- Existing Street
- Proposed Future Street

Coverage in Mintutes

- 0 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- City Limit

Potential Sunset & Chemong Location

Potential Ashburnham Location

Little Lake

peterborough

Kilometers

0.5 0.25 0 0.5 1 1.5 2

June, 2020

Produced by Geomatics/Mapping, City of Peterborough

Initial Arriving Company Heritage TI & Ashburnham

4 Firefighters in 4 Minutes of Travel Time	
% Historic Calls Covered	75.9%
% Municipal Area Covered	48.1%
% Road Length Covered	54.2%

Legend

- 4 — Potential Ashburnham Dr Location
- 2 — Potential Heritage Trail Location
- 1 — Existing Fire Station 1
- 3 — Existing Fire Station 3

Streets

- Existing Street
- Proposed Future Street

Coverage in Minutes

- 0 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- City Limit

Potential Heritage TI Location

Potential Ashburnham Location

N

Little Lake

peterborough

Kilometers

0.50.25 0 0.5 1 1.5 2

June, 2020

Produced by Geomatics/Mapping, City of Peterborough

Initial Arriving Company
Existing Station 2 & Ashburnham

4 Firefighters in 4 Minutes of Travel Time	
% Historic Calls Covered	77.3%
% Municipal Area Covered	49.3%
% Road Length Covered	55.1%

Legend

- 4 — Potential Ashburnham Dr Location
- 1 — Existing Fire Station 1
- 2 — Existing Fire Station 2
- 3 — Existing Fire Station 3

Streets

- Existing Street
- Proposed Future Street
- City Limit

Coverage in Minutes

Name

- 0 - 4
- 4 - 6
- 6 - 8
- 8 - 10

Potential Ashburnham Location

Little Lake

Kilometers

0.50.25 0 0.5 1 1.5 2

June, 2020
Produced by Geomatics/Mapping, City of Peterborough

Appendix E

Initial Arriving Company Modelling - Parkhill Four Station Model

DILLON CONSULTING

Initial Arriving Company
Dennistoun & Parkhill

4 Firefighters in 4 Minutes of Travel Time	
% Historic Calls Covered	80.2%
% Municipal Area Covered	47.1%
% Road Length Covered	53.8%

Legend

- 4 — Potential Parkhill Location
- 2 — Potential Dennistoun Location
- 1 — Existing Fire Station 1
- 3 — Existing Fire Station 3

Streets

- Existing Street
- Proposed Future Street

Coverage in Minutes

- 0 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- City Limit

Potential Dennistoun Location

Potential Parkhill Location

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Kilometers

0.50.25 0 0.5 1 1.5 2

June, 2020

Produced by Geomatics/Mapping, City of Peterborough

Initial Arriving Company
Northcrest & Parkhill

4 Firefighters in 4 Minutes of Travel Time	
% Historic Calls Covered	81.7%
% Municipal Area Covered	48.4%
% Road Length Covered	56.7%

Legend

- 4 — Potential Parkhill Location
- 2 — Potential Northcrest Location
- 1 — Existing Fire Station 1
- 3 — Existing Fire Station 3

Streets

- Existing Street
- Proposed Future Street

Coverage in Minutes

- 0 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- City Limit

Potential Northcrest Location

Potential Parkhill Location

Woodland Dr
Pioneer Rd
Armour Rd
University Rd
Cumberland Av
Water St
Towerhill Rd
Chemong Rd
Hilliard St
Lily Lake Rd
Fairbairn St
Parkhill Rd E
Parkhill Rd W
McDonnel St
Reid St
George St N
Hunter St E
Medical Dr
Aylmer St N
Rubidge St
Charlotte St
Maria St
Little Lake
Sherbrooke St
Park St N
Monaghan Rd
Ashburnham Dr
Lansdowne St E
Clonsilla Av
Park St S
Aylmer St S
George St S
River Rd S
Lansdowne St W
Breeley Dr
The Queensway
Kennedy Rd
Bensfort Rd
The Parkway
Crawford Dr
Johnston Dr
Airport Rd
115

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Kilometers

0.5 0.25 0 0.5 1 1.5 2

June, 2020

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Initial Arriving Company
Towerhill & Parkhill

4 Firefighters in 4 Minutes of Travel Time	
% Historic Calls Covered	76.1%
% Municipal Area Covered	48.4%
% Road Length Covered	55.7%

Legend

- 2 — Potential Towerhill Location
- 4 — Potential Parkhill Location
- 1 — Existing Fire Station 1
- 3 — Existing Fire Station 3

Streets

- Existing Street
- Proposed Future Street

Coverage in Minutes

- 0 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- City Limit

Potential Towerhill Location

Potential Parkhill Location

N

Woodland Dr
Pioneer Rd
Armour Rd
Carnegie Av
University Rd
Cumberland Av
Water St
Armour Rd
Towerhill Rd
Chemong Rd
Hilliard St
Lily Lake Rd
Fairbairn St
Parkhill Rd E
Parkhill Rd W
Medical Dr
McDonnel St
Reid St
George St N
Hunter St E
Telephone Rd
Aylmer St N
Rubidge St
Charlotte St
Maria St
Sherbrooke St
Park St N
Monaghan Rd
Ashburnham Dr
Lansdowne St E
Clonsilla Av
Aylmer St S
Park St S
George St S
River Rd S
Lansdowne St W
Breeley Dr
The Queensway
Kennedy Rd
Bensfort Rd
The Parkway
Crawford Dr
Johnston Dr
Airport Rd
115
Little Lake

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Kilometers

0.50.25 0 0.5 1 1.5 2

June, 2020

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Initial Arriving Company Sunset/Chemong & Parkhill

4 Firefighters in 4 Minutes of Travel Time	
% Historic Calls Covered	81.0%
% Municipal Area Covered	49.0%
% Road Length Covered	55.9%

Legend

- 4 — Potential Parkhill Location
- 2 — Potential Sunset & Chemong Location
- 1 — Existing Fire Station 1
- 3 — Existing Fire Station 3

Streets

- Existing Street
- Proposed Future Street

Coverage in Minutes

- 0 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- City Limit

Potential Sunset & Chemong Location

Potential Parkhill Location

Little Lake

Woodland Dr
Pioneer Rd
Armour Rd
University Rd
Carnegie Av
Water St
Cumberland Av
Towerhill Rd
Chemong Rd
Hilliard St
Lily Lake Rd
Fairbairn St
Parkhill Rd W
Parkhill Rd E
McDonnel St
Reid St
George St N
Hunter St E
Medical Dr
Aylmer St N
Rubidge St
Charlotte St
Maria St
Ashburnham Dr
Sherbrooke St
Park St N
Monaghan Rd
Clonsilla Av
Park St S
Aylmer St S
George St S
Lansdowne St E
Lansdowne St W
River Rd S
Breeley Dr
The Queensway
The Parkway
Crawford Dr
Johnston Dr
Kennedy Rd
Bensfort Rd
Airport Rd
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Kilometers

0.50.25 0 0.5 1 1.5 2

June, 2020

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Initial Arriving Company
Heritage & Parkhill

4 Firefighters in 4 Minutes of Travel Time	
% Historic Calls Covered	76.5%
% Municipal Area Covered	46.7%
% Road Length Covered	53.7%

Legend

- 4 — Potential Parkhill Location
- 2 — Potential Heritage Trail Location
- 1 — Existing Fire Station 1
- 3 — Existing Fire Station 3

Streets

- Existing Street
- Proposed Future Street

Coverage in Minutes

- 0 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- City Limit

Potential Heritage TI Location

Potential Parkhill Location

Little Lake

Woodland Dr
Pioneer Rd
Armour Rd
University Rd
Gumberland Av
Water St
Towerhill Rd
Chemong Rd
Hilliard St
Armour Rd
Lily Lake Rd
Fairbairn St
Parkhill Rd E
Parkhill Rd W
Medical Dr
McDonnel St
Reid St
George St N
Hunter St E
Rubidge St
Aylmer St N
Charlotte St
Maria St
Ashburnham Dr
Sherbrooke St
Park St N
Monaghan Rd
Clonsilla Av
Aylmer St S
Park St S
George St S
Lansdowne St E
Lansdowne St W
River Rd S
Breealey Dr
The Queensway
The Parkway
Crawford Dr
Johnston Dr
Kennedy Rd
Bensfort Rd
Airport Rd
115

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Kilometers

0.50.25 0 0.5 1 1.5 2

June, 2020

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Initial Arriving Company
Existing Station 2 & Parkhill

4 Firefighters in 4 Minutes of Travel Time	
% Historic Calls Covered	78.1%
% Municipal Area Covered	48.1%
% Road Length Covered	55.0%

Legend

- 4 — Potential Parkhill Location
- 1 — Existing Fire Station 1
- 2 — Existing Fire Station 2
- 3 — Existing Fire Station 3

Streets

- Existing Street
- Proposed Future Street

Coverage in Minutes

- 0 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- City Limit

Potential Parkhill Location

Little Lake

Kilometers
0.50.25 0 0.5 1 1.5 2

June, 2020
Produced by Geomatics/Mapping, City of Peterborough

Appendix F

Overall Pairwise Comparison and Ranking Results

DILLON CONSULTING

Overall Station Location Options Evaluation

Station 4 Options		Ashburnham					Parkhill				
Station 2 Options		Dennistoun	Northcrest	Towerhill	Sunset	Heritage	Dennistoun	Northcrest	Towerhill	Sunset	Heritage
Criteria	Criteria Priority	DA	NA	TA	SA	HA	DP	NP	TP	SP	HP
Initial Arriving Company	High	6	2	4	1	8	9	3	7	5	10
Risk	High	2	7	5	4	9	1	8	6	2	10
Cost	High	1	1	7	1	7	1	1	7	1	7
Second Arriving Company	Medium	1	5	4	3	8	2	7	9	6	10
Site Characteristics	Medium	5	5	1	5	1	5	5	1	5	1
Initial Full Alarm	Low	3	8	6	5	10	2	7	4	1	9
Land Use	Low	7	7	3	1	3	7	7	3	1	3

DILLON CONSULTING

Appendix F - Overall Pairwise Comparison and Ranking Results
City of Peterborough
Fire Station 2 Location Review
June 10, 2020 - 18-8071

Overall Paired Comparison Analysis

	High	Medium	Low	Results
DA vs NA	(2-2)	(2-1)	(2-1)	DA
DA vs TA	(2-1)	(1-1)	(1-1)	DA
DA vs SA	(2-2)	(2-1)	(1-1)	DA
DA vs HA	(3-0)	(1-1)	(1-1)	DA
DA vs DP	(2-2)	(2-1)	(1-2)	DA
DA vs NP	(2-2)	(2-1)	(2-1)	DA
DA vs TP	(3-0)	(1-1)	(1-1)	DA
DA vs SP	(2-3)	(2-1)	(0-2)	SP
DA vs HP	(3-0)	(1-1)	(1-1)	DA
NA vs TA	(2-1)	(0-2)	(0-2)	NA
NA vs SA	(1-3)	(1-2)	(0-2)	SA
NA vs HA	(3-0)	(1-1)	(1-1)	NA
NA vs DP	(2-2)	(1-2)	(1-2)	DP
NA vs NP	(3-1)	(2-1)	(1-2)	NA
NA vs TP	(2-1)	(1-1)	(0-2)	NA
NA vs SP	(2-2)	(1-2)	(0-2)	SP
NA vs HP	(3-0)	(1-1)	(1-1)	NA
TA vs SA	(0-3)	(1-1)	(0-2)	SA
TA vs HA	(3-1)	(2-1)	(2-1)	TA
TA vs DP	(1-2)	(1-1)	(1-1)	DP
TA vs NP	(1-2)	(2-0)	(2-0)	NP
TA vs TP	(3-1)	(2-1)	(1-2)	TA
TA vs SP	(1-2)	(2-0)	(1-1)	SP
TA vs HP	(3-1)	(2-1)	(2-1)	TA
SA vs HA	(3-0)	(1-1)	(2-0)	SA
SA vs DP	(2-2)	(1-2)	(1-1)	SA
SA vs NP	(3-1)	(2-1)	(2-0)	SA
SA vs TP	(3-0)	(1-1)	(1-1)	SA
SA vs SP	(2-2)	(2-1)	(1-2)	SA
SA vs HP	(3-0)	(1-1)	(2-0)	SA
HA vs DP	(1-2)	(1-1)	(1-1)	DP
HA vs NP	(0-3)	(1-1)	(1-1)	NP
HA vs TP	(1-3)	(2-1)	(1-2)	TP
HA vs SP	(0-3)	(1-1)	(1-1)	SP
HA vs HP	(3-1)	(2-1)	(1-2)	HA
DP vs NP	(2-2)	(2-1)	(2-1)	DP
DP vs TP	(2-1)	(1-1)	(1-1)	DP
DP vs SP	(2-2)	(2-1)	(0-2)	DP
DP vs HP	(3-0)	(1-1)	(1-1)	DP
NP vs TP	(2-1)	(1-1)	(0-2)	NP
NP vs SP	(2-2)	(1-2)	(0-2)	SP
NP vs HP	(3-0)	(1-1)	(1-1)	NP
TP vs SP	(0-3)	(1-1)	(0-2)	SP
TP vs HP	(3-1)	(2-1)	(2-1)	TP
SP vs HP	(3-0)	(1-1)	(2-0)	SP

Overall Ranked Results

Station Option	Paired Comparison Wins	Overall Rank
DA	8	1
SA	8	1
DP	7	3
SP	7	3
NA	5	5
NP	4	6
TA	3	7
TP	2	8
HA	1	9
HP	0	10

DILLON CONSULTING

Appendix G

Initial Arriving Company Modelling – Three Station Model

DILLON CONSULTING

Initial Arriving Company Stations 1, 3 & Dennistoun

Legend

- Potential Dennistoun Location
- Existing Fire Station 1
- Existing Fire Station 3

Streets

- Existing Street
- Proposed Future Street
- 4 min
- 6 min
- 8 min
- 10 min
- City Limit

4 Firefighters in 4 Minutes of Travel Time	
% Historic Calls Covered	75.1%
% Municipal Area Covered	38.2%
% Road Length Covered	44.8%

Potenial Dennistoun Location

Woodland Dr
Pioneer Rd
Armour Rd
Carnegie Av
University Rd
Cumberland Av
Water St
Towerhill Rd
Chemong Rd
Hilliard St
Armour Rd
Lily Lake Rd
Fairbairn St
Parkhill Rd E
Parkhill Rd W
McDonnel St
Reid St
George St N
Hunter St E
Medical Dr
Aylmer St N
Rubidge St
Charlotte St
Maria St
Sherbrooke St
Park St N
Monaghan Rd
Clonsilla Av
Aylmer St S
George St S
Park St S
Ashburnham Dr
Lansdowne St E
Lansdowne St W
River Rd S
Breeley Dr
The Queensway
The Parkway
Crawford Dr
Johnston Dr
Kennedy Rd
Bensfort Rd
Airport Rd
Little Lake
115

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Kilometers

0.50.25 0 0.5 1 1.5 2

June, 2020

Produced by Geomatics/Mapping, City of Peterborough

Initial Arriving Company
Stations 1, 3 & Sunset/Chemong

Legend

- Potential Sunset & Chemong Location
- Existing Fire Station 1
- Existing Fire Station 3

Streets

- Existing Street
- Proposed Future Street
- 4 min
- 6 min
- 8 min
- 10 min
- City Limit

4 Firefighters in 4 Minutes of Travel Time	
% Historic Calls Covered	76.1%
% Municipal Area Covered	40.1%
% Road Length Covered	47.1%

Potential Sunset/Chemong Location

N

Woodland Dr
Pioneer Rd
Armour Rd
University Rd
Carnegie Av
Water St
Cumberland Av
Towerhill Rd
Chemong Rd
Hilliard St
Armour Rd
Lily Lake Rd
Fairbairn St
Parkhill Rd E
Parkhill Rd W
Medical Dr
McDonnel St
Reid St
George St N
Hunter St E
Wilson Rd
Aylmer St N
Rubidge St
Charlotte St
Maria St
Park St N
Sherbrooke St
Monaghan Rd
Clonsilla Av
Aylmer St S
Park St S
George St S
Ashburnham Dr
Lansdowne St E
Little Lake
Lansdowne St W
Bradley Dr
The Queensway
The Parkway
Crawford Dr
Johnston Dr
River Rd S
Kennedy Rd
Bensfort Rd
Airport Rd
115

peterborough

Kilometers
0.5 0.25 0 0.5 1 1.5 2

June, 2020
Produced by Geomatics/Mapping, City of Peterborough

Initial Arriving Company Stations 1, 3 & Northcrest

4 Firefighters in 4 Minutes of Travel Time	
% Historic Calls Covered	75.8%
% Municipal Area Covered	39.3%
% Road Length Covered	47.5%

Legend

- Potential Northcrest Location
- Existing Fire Station 1
- Existing Fire Station 3

Streets

- Existing Street
- Proposed Future Street

- 4 min
- 6 min
- 8 min
- 10 min
- City Limit

Potential Northcrest Location

Little Lake

Kilometers

0.50.25 0 0.5 1 1.5 2

June, 2020
Produced by Geomatics/Mapping, City of Peterborough

Initial Arriving Company
Existing Fire Stations

Legend

- Existing Fire Station 1
- Existing Fire Station 2
- Existing Fire Station 3

Streets

- Existing Street
- Proposed Future Street
- 4 min
- 6 min
- 8 min
- 10 min
- City Limit

4 Firefighters in 4 Minutes of Travel Time	
% Historic Calls Covered	71.9%
% Municipal Area Covered	38.8%
% Road Length Covered	45.3%

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Kilometers

0.50.25 0 0.5 1 1.5 2

June, 2020

Produced by Geomatics/Mapping, City of Peterborough