

TO:	CHAIR AND MEMBERS PUBLIC SAFETY COMMITTEE MEETING ON MARCH 6, 2012
FROM:	JOHN KOBARDA FIRE CHIEF
SUBJECT:	REPORT ON LONDON FIRE DEPARTMENT AERIAL AND TANKER FLEET

RECOMMENDATION

That, on the recommendation of the Fire Chief, the following report **BE RECEIVED** for information purposes.

PREVIOUS REPORTS PERTINENT TO THIS MATTER

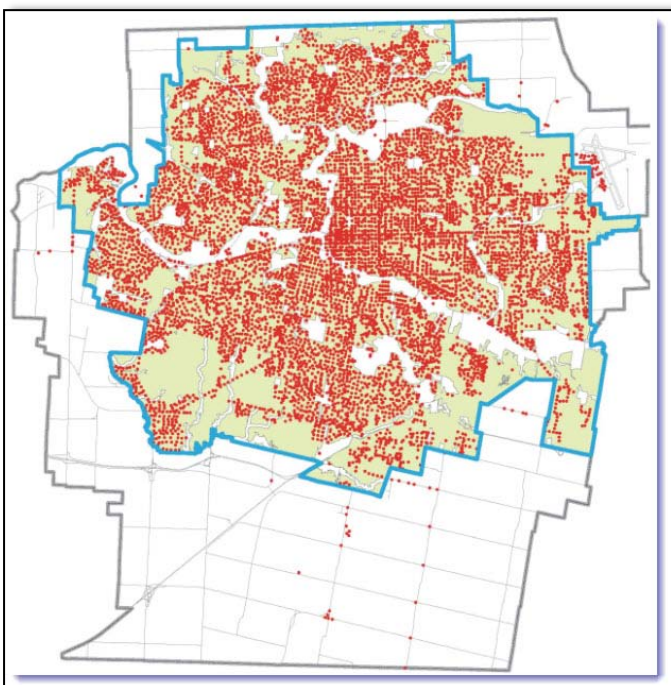
- February 25, 2009 – Station 14 Update
- April 29, 2009 - Fire Master Plan – Organization & Resource Deployment Analysis for the London Fire Services

BACKGROUND

At its meeting of February 2, 2012 meeting, the Services Review Committee requested that the Fire Chief report on certain matters concerning its fleet of Aerials and Tankers. It is the purpose of this report to address the questions raised at that meeting.

Background

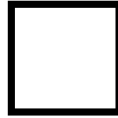
Figure 1: City of London – Urban Growth Boundary and Hydrant Serviced Areas



The 1991 Stats Canada Census reported that London’s population living within its geographic area of 165.62 km² was 303,250, noting that at that time a large percentage of the area was already developed. The 1993 annexation caused the City to undergo a significant transformation with its geographic land mass growing to 423 km², along with a small increase in population to 311,900. The results of the 2011 Stats Canada Census identified the City’s population to be 366,250 permanent residents. Of equal consideration is the growth in the developed/planned areas of the City known as the Urban Growth Boundary (UGB) that is now 236 km², which is significantly larger than the pre-annexation service area.

With respect to the UGB, the majority of the area is serviced with hydrants, as

shown by the red dots within the blue lines in Figure 1; however, 186 km² outside the UGB remain without hydrant service, albeit there are hydrants along Highbury Avenue S. and Wellington Road, S. The latter have greatly assisted with fire fighting in southern rural London with improved turnaround times for Tanker shuttles.



Evolution of London Fire Department Frontline Fleet

Preceding annexation, the London Fire Department's (LFD) frontline response fleet included ten (10) Engine Companies, four (4) Aerial Truck Companies, two (2) Rescue Unit Companies and two (2) Command Cars. With annexation, the Department added a third (3rd) Command Car, as well as took over Station 11, which was equipped with one (1) Engine, one (1) Rescue Unit and two (2) newly City purchased Tankers. Because of a Provincial requirement, former Town of Westminster volunteer Fire Fighters staffed the fire apparatus at Station 11. By 1995, the City disbanded the volunteers and transitioned to full-time Fire Fighters as it deemed the original model unsustainable because response by the volunteer staff became unpredictable.

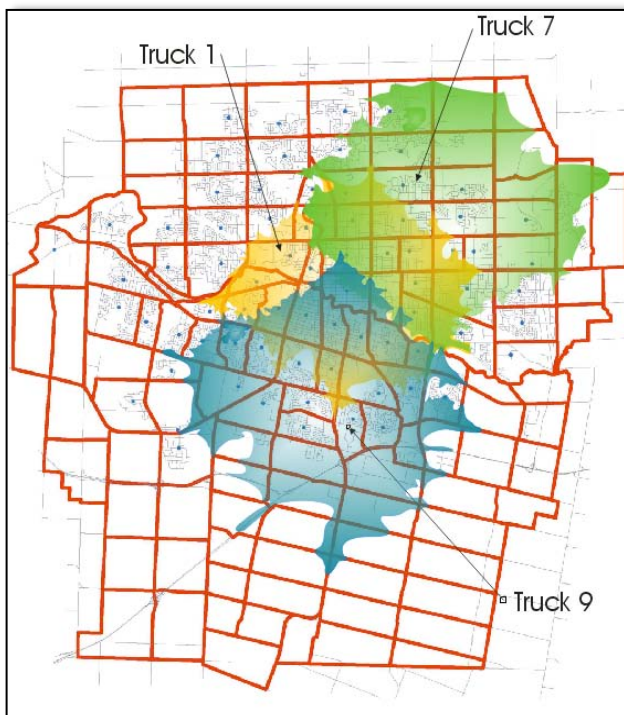
Because of financial challenges faced by the City, the LFD decommissioned the third (3rd) Command Car and one (1) of its four (4) Aerials, which left the west and northwest areas of the City without proper Aerial response. While the Department deployed two (2) Quints in these areas, these vehicles did not provide an adequate response, particularly with the number of high-rise multi-residence occupancies, which have increased in number since that time.

Aerial Truck Redeployment – Plan for the West/Northwest

This section addresses the questions concerning the LFD Aerial deployment plan, as well as the efforts of the Department to find economies and efficiencies to servicing the west and northwest areas of the City, which has experienced significant growth, including the addition of several high-rise, multi-residential occupancies. The questions asked by the Service Review Committee were as follows:

- 1) How many times do Aerials respond?
- 2) How would the Aerials be deployed if the LFD complement of Aerial Trucks was reduced by one vehicle?

Figure 2: Aerial Coverage – Pre Redeployment

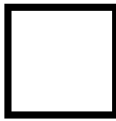


As reported in the February 25, 2009 report to the Board of Control, a significant service deficiency existed in the west and north west areas of the City, more specifically with respect to Engine coverage related to significant growth as well as the lack of an Aerial Truck in light of a number of existing high-rise multi-residential occupancies and a number more planned. Noted earlier, the LFD did have an Aerial Truck at Station 6 until the mid-1990s that would have provided an appropriate response to this area. Figure 1 illustrates the Aerial Truck service gap prior to the redeployment plan of existing resources.

Traditionally, when a new single vehicle station is opened, 20 Fire Fighters are hired; however, the opening of Station 14 presented the LFD an opportunity to redeploy its three (3) Aerial Trucks

thereby providing consistent Aerial Truck service across the City. The introduction of the Pumper Rescue concept, another cost containment and efficiency initiative, provided an opportunity to further introduce efficiencies by reducing its dedicated Rescue Unit complement from two (2) to one (1) and redeploying the staff from Rescue 6 along with four (4) new hires to Station 14. It should be noted that the Department implemented another cost containment strategy hiring only four (4) staff for a total of 16 along with the use of some overtime, whereas ideally another eight (8) would have been hired.

In the aforementioned report, the LFD provided a detailed plan with response maps with the Departments plans to transition from a traditional single purpose apparatus deployment model to a multi-functional fire apparatus deployment model, which is currently underway. Although the maps are not included, Appendix A shows the plan, albeit there will be some tweaking of actual vehicle deployment.



Speaking only to the Station 14/Rescue 6 initiatives described earlier, the Corporation realized significant cost containment. Tables 1 and 2 below provide an overview of the costs of a traditional deployment model in comparison to the one described. For the purposes of costing, the expenditures assigned against the Fire Fighter positions are the incremental differences that flow from promotions and reclassifications. For example, a Senior Qualified Fire Fighter earning 102% of the 1st Class Fire Fighter rate receives an additional 13% when promoted to Captain and so on. Excluding annual increases, the flow through increases primarily arise from the recruit Fire Fighters moving through the classifications from 5th Class Probationary – 1st 6 months (65% of 1st Class Fire Fighter) to 1st Class in the 4th year. Figure 1 shows the projected flow through cost of operating Station 14 from approximately July 2010 until December 31, 2015 using the traditional model and projected 2010 salary and benefit rates. These estimates are subject to change based on negotiated and/or awarded increases to salaries and benefits. It should also be noted that additional flow through increases such as experience pay are not shown because new employees are not eligible for the premium until their eighth (8th) year. As such, future additional flow through costs associated with this premium will be come into effect at 8, 17, and 23 years of service.

Table 1: Projected Annualized Operating Cost (\$2010) Using Traditional Staffing Model

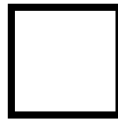
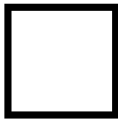
	Cost of 20 Fire Fighters	Incremental Cost of 4 – Captains 4 – SQFF 4 – FFAOs	Other Operating Expenses	Total Cost of a Single Engine Station
2010 (half year)	\$700,000	\$38,000	\$25,000	\$763,000
2011	\$1,625,000	\$76,000	\$41,000	\$1,742,000
2012	\$1,775,000	\$76,000	\$41,000	\$1,892,000
2013	\$1,900,000	\$76,000	\$41,000	\$2,017,000
2014	\$2,050,000	\$76,000	\$41,000	\$2,167,000
2015	\$2,175,000	\$76,000	\$41,000	\$2,292,000

Originally, as noted earlier, the LFD requested eight (8) additional staff; however, it amended the staffing model and instead requested four (4) additional Fire Fighters in its 2010 budget. The proposed cost of the new model is shown in Table 2 but it is amended based on hiring four (4) Fire Fighters, whereas the original table showed eight (8) new Fire Fighters. As such, the proposed model now in place results in \$1,740,000 in savings over a traditional deployment model. The information provided shows that the City has already significantly benefited from efficiencies.

Table 2 - Projected Annualized Operating Cost (\$2010) Using Proposed Staffing Model

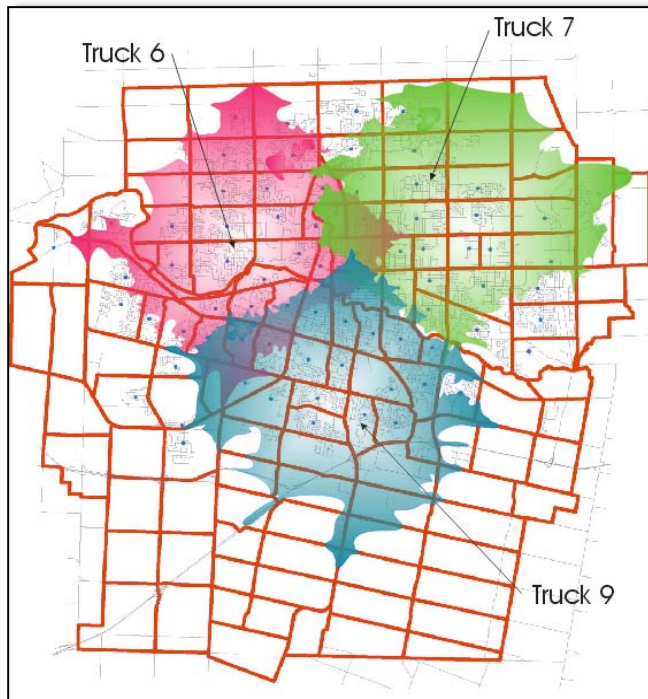
	Cost of 8 Fire Fighters	Incremental Cost of 4 – Captains 4 – SQFF 4 – FFAOs	Other Operating Expenses	Total Cost of a Single Engine Station
2010 (half year)	\$140,000	\$38,000	\$25,000	\$203,000
2011	\$325,000	\$76,000	\$41,000	\$442,000
2012	\$355,000	\$76,000	\$41,000	\$472,000
2013	\$380,000	\$76,000	\$41,000	\$497,000
2014	\$410,000	\$76,000	\$41,000	\$527,000
2015	\$435,000	\$76,000	\$41,000	\$552,000

Firefighting is a very labour intensive activity with NFPA standards requiring 15 Fire Fighters to arrive in eight (8) minutes of an alarm to a house fire. Higher risk building types such as, but not limited to, high-rise multi-residential occupancies, propane facilities, manufacturing and processing plants, hospitals, long term care homes, etc., require a greater number of staff, as well as the type of fire apparatus dispatched. The number of Fire Fighters required could easily reach 30 to 60 depending on the type of occupancy, the perceived risk and the extent of the fire. The LFD’s minimum staffing is 72 Fire Fighters, so its alarm readiness for an additional alarm can be diminished significantly. On reviewing the risks within the City, the Master Fire Plan, which was commissioned by the City, confirmed the need for three (3) Aerials although it



recommended a redeployment of that resource. It also recommended that the City immediately increase staffing on all Aerials Trucks to four (4) Fire Fighters from its current model of three (3) on an Aerial platform and two (2) on a straight Aerial Truck.

Figure3: Aerial Truck Re-Deployment Plan



Supporting the recommendation, Tridata, the author of the Master Fire Plan cited three (3) references: NFPA 1710, NFPA 1500 and its own research of other comparable municipalities.

Section 4.1.2.1.1 (2) of NFPA 1710 defines response performance as follows: “Four minutes (240 seconds) or less for the arrival of the first arriving engine company at a fire suppression incident and/or 8 minutes (480 seconds) or less for the deployment of a full first alarm assignment at a fire suppression incident”. The response map shown in Figure 3 illustrates the eight (8) minute response areas for the Department’s Aerials. There is an overlap in the core of the City; however, given the type of occupancies and a need to deploy more than one (1) Aerial to an alarm the overlap is ideal. The Aerial Truck Redeployment Plan maximizes coverage

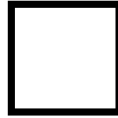
across the City with three (3) Aerials. Any fewer Aerials would result in significant deficiencies.

Concerning staffing per vehicle, Section 5.2.2.2.1 of NFPA states, “These companies shall be staffed with a minimum of four on-duty personnel (Note: Engine, Truck or Ladder Companies). As noted, the current staffing model does not meet the standard and will impact response across the City, albeit the Service Review Committee has deferred the Business Case until 2013 for consideration.

Noted earlier, Tridata also reviewed Engine to Aerial Truck ratios in its analysis of the LFD’s fleet configuration. Tridata notes that NFPA recommends an Engine to Aerial ratio of between 2 to 1 and 3 to 1 depending upon activity. They also add that suburban departments tend to use a ratio of up to 4 to 1. The LFD currently has 14 Engine Companies comprised of five (5) multi-functional Pumper Rescues, three (3) Quints, and six (6) single purpose Engines, as well as three (3) Truck Companies, the latter which consists of one (1) Aerial Platform and two (2) straight Aerials, providing an Engine Company to Truck Company ratio of 4.67 to 1. While its ratio is slightly higher than the recommendation indicating a potential requirement of an additional aerial, this configuration provides the Department with flexibility as it can deploy its Quints as Aerials when the need arises. That said; the City should look toward adding an additional Truck Company with the opening of its next station in the southeast.

Further to the above, another consideration that requires equal mention is the ability to handle more than one (1) emergency event. Currently, the LFD can accommodate two (2) simultaneous fires noting that one (1) Command Car, one (1) Truck Company and four (4) Engines Companies would be committed at each event. That would leave no Command Cars, one (1) Aerial and six (6) Engines to cover the entire City. There have been situations, one as recent as last month, where only two (2) Engine Companies were available. From a fire department perspective, unlike GTA fire departments, the LFD cannot draw upon neighboring municipalities with full-time fire departments to assist in protecting the City. Mutual Aid could be used; however, the County fire departments are not resource rich to be able to provide a great deal of resources. Removal of an Aerial Company would dilute the LFD’s response capabilities.

On the matter of responses by the LFD’s Aerial Truck fleet, in 2011 the combined response was 2,586 emergency dispatches for an average of 862 calls per Aerial. An actual count by vehicle cannot be provide at this time, as the first phase of the redeployment commenced in April 2011, with the redeployment complete in the spring of 2013 with the opening of Station 7.



Tankers

This section addresses the questions concerning the LFD Tanker fleet. The questions asked by the Service Review Committee were as follows:

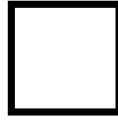
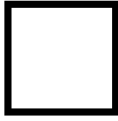
- 1) How many times the London Fire Department's (LFD) Tankers respond per year?
- 2) Can the staffing assigned to the Tankers be eliminated and be staffed on an "as need" basis?

The LFD currently consists of two (2) staffed Tankers, as well as a backup Tanker used to replace the frontline Tankers during service work, thereby ensuring continuity and consistency of service. The City staffed the Tanker fleet on Council's decision in 1995 to disband the Westminster volunteer Fire Fighters. Based on that decision and in accordance with Article 20.04 of the Collective Agreement, the City was required to place an Officer and a driver, now known as Fire Fighter Apparatus Operator (FFAO), on the Tankers. Recognizing the expense of assigning four (4) Officers (1 Officer x 4 platoons) on each vehicle, the Association agreed to limit the staffing to only an FFAO. Originally, the agreement between the parties was documented in a Letter of Understanding; however, it was enshrined in the Collective Agreement in the early part of last decade. The requirement to staff the vehicles as herein noted is shown in Article 20.04 below. Accordingly, the City cannot unilaterally vary the staffing without the Association's concurrence.

20.04(a) *On all shifts at each station where any of the following vehicles are assigned, namely: Pumpers, Aerials, Rescue vehicles, and any other vehicle which responds on the first response to a general alarm, save and except all other vehicles not assigned to first line fire duty, or any Tanker(s), an Officer of the rank of Captain or above shall be assigned to be in charge of the same and where no such Officer is so assigned and on duty, the most senior Fire Fighter, qualified and capable as a Captain and who is on duty on the said shift, shall be assigned to be in charge of the same and be paid at the rate of a Captain on each such shift where he/she so acts.*

(b) ***On all shifts at each station where any of the following vehicles are assigned, namely: Pumpers, Aerials, Rescue vehicles, in-service Tankers (total of two (2)), and any other vehicle which responds on the first response to a general alarm, save and except all other Department vehicles not assigned to first line fire duty, a Firefighter/Apparatus Operator shall be assigned to drive and operate the vehicle and where no such Firefighter/Apparatus Operator is so assigned and on duty, a Fire Fighter, qualified and capable as a Firefighter/Apparatus Operator, with 8 or more years of service, and who is on duty on the said shift, shall be assigned to drive the vehicle, noting that only those Fire Fighters, qualified and capable as a Firefighter/Apparatus Operator, with 8 or more years of service who have declined to participate in the Company Officer Development Program (CODP), shall be paid at the rate of a Firefighter/Apparatus Operator (as set out in Article 11.01) on each such shift where he/she so acts.***

Notwithstanding the above, operationally it would be very difficult to operate the Tankers without the assigned staff. Currently, the LFD stations its Tankers in its southern most stations, which border the area outside the UGB, currently Station 5 and Station 11. If hypothetically other FFAOs were to pick up the Tankers two (2) problems would arise. First, another vehicle approximately four (4) minutes away would have to drive to Station 5 or Station 11 or both to pick up the Tanker(s). For example, using the fire on Highbury Ave S. that occurred in December 2011 as an example, the Department originally dispatched Car 2, Truck 2, Rescue 1, Engine 5, Engine 9, Engine 2, as well as Tanker 5 and Tanker 11. If the Tankers were unstaffed, the Engine 11 FFAO would have to respond with Tanker 11 and Engine 2 would have to respond to Station 5 to pick up Tanker 5. That would leave two (2) Engine Companies out of service, as they would not have an FFAO to operate them. As such, 33% of the Engine fleet would be committed. During that event, the Incident Commander requested another Engine Company for assistance, thereby taking another Engine Company out of service for other alarms. This would have resulted in the commitment of 43% of the Engine fleet. For the reasons noted in the Aerial section of this report, a removal of this number of fire apparatus severely hampers the LFD's ability to respond to any more than one (1) more event, leaving very few vehicles to cover the rest of the City and limited options to resolve the situation. If the Department was fortunate enough to have a couple Fire Fighters on duty more than the minimum complement of 72, it could reassign staff but that could take a ½ hour or more before



the other two (2) Engines were placed back into service. Another option is calling people on overtime; however, experience shows that could take up to an hour and is also dependent on finding someone willing to come in for a few hours.

Contained within the background of this report is an explanation of how annexation transformed the City and the challenges it inherited as a result of the same. While the City added hydrants along Highbury Avenue S. and Wellington Road S., areas outside the UGB remain without hydrants. Over 186 km² outside the UGB remain without hydrants with Tanker shuttles providing the only means to fight fires.

Despite the identified need for mobile water support in those areas without hydrant service, a question may arise as to whether the City needs its own Tankers and instead should explore purchasing such a service from the surrounding municipalities. The first questions that arises is whether those municipalities would be prepared to let this valuable resource leave their municipality for the purposes of bringing in some revenue, noting that they have very few stations covering a large geographic area. Concerning the latter, another issue arises with respect to the timeliness of response in that it could take five (5) minutes or more for volunteer Fire Fighters to get to their station, which is an unavoidable delay, noting that they would then need to respond from a station, which in most cases is farther away than a London station, thereby further contributing to the delay of a water supply. LFD Engines carry 500 gallons of water, while the Quints carry 400 gallons. If the responding crew only deployed a 1-3/4" line, the vehicles could sustain a flow for 5 or 4 minutes, respectively. In the case of a 2-1/2" line, the flow time would decrease to 2-1/2 or 2 minutes, respectively. Furthermore, eliminating Tankers and negotiating the purchase of such services is not an option, as Article 1.04 of the Collective Agreement also contains "no contracting out" language that prevents the service being provided solely by another municipality(ies). The staffing article also specifically identifies two (2) Tankers. Therefore, the inherent delays associated with a contracted service as well as the Collective Agreement implications make such a concept unfeasible.

In 2011, the LFD Tankers responded to 306 events. The LFD uses Tankers not only for providing water to fire emergency scenes in areas not serviced by hydrants but also within the City when water supplies are in question such as when water and sewer lines are replaced. Furthermore, it uses the Tankers to protect Fire Fighters and victims during emergency events that occur on roads and highways with speed limits at or exceeding 80 km/h, which account for 164 of the calls last year; however, it should be noted that the vehicles also provide another source of water should a fire erupt enroute to the scene or during the required emergency work. Where a risk of injury or death is possible, employers are required to exercise due diligence and take those steps necessary to protect the employee. In Ontario and throughout North America there have been circumstances where Fire Fighters, Police Officers and Paramedics have been struck by vehicles causing injury death in the performance of their duties. The Occupational Health and Safety Act requires that "every precaution reasonable in the circumstances for the protection of a worker" be taken if an employer knows of a dangerous situation. Dispatching another type of vehicle such as an Engine is an option; however, they are more expensive to replace should they be hit and destroyed, near impossible to replace to specification quickly and would again take a vehicle out of response ready mode.

It is also important to note that the Province has mandated the Ontario Provincial Police (OPP) to implement a new Traffic Emergency Management system because of the economic impact of closing a 400 series highway, which the Province estimates at \$34 million per hour for the 401 and \$20 million per hours for the 402. Accordingly, there are significant economic pressures upon the OPP to open a highway as soon as possible after a vehicle collision with its preference to only close as many lanes as necessary, in order to keep traffic moving at all times. Whenever traffic continues past an incident with emergency responders on scene it is imperative that a blocker vehicle be placed in order to provide protection to the emergency responders.

Vehicle collisions and the resulting traffic congestion can lead to driver frustrations, impatience and road rage. Base on information provided, the OPP estimates that between 20% and 30% of vehicle collisions on the 400 series highways are secondary crashes caused by minor incidents up ahead. Many of the secondary crashes are more serious than the initial one and may include First Responders. This information reinforces the fact that safe systems of work must be established to provide maximum scene safety for First Responders and the use of a blocker vehicle is a fundamental part of that approach.

Acknowledgments: G. Francis, J. Fleming, P. Yeoman, M. Boulger

SUMMARY

In 1991 Stats Canada Census reported that London's population of 303,250 lived within a geographic area of 165.62 km², with much of it developed; however, annexation in 1993 expanded the land mass to 423 km². At that time, the LFD's fleet included four (4) dedicated aerials with two (2) staffed with no less than three (3) Fire Fighters and the other two (2) with two (2) Fire Fighters, which provided consistent aerial coverage across the City.

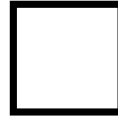
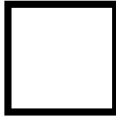
The 2011 Stats Canada Census identifies the City's population to be 366,250, noting that developed/planned developed geographic area of the City known the Urban Growth Boundary (UGB) that is now 236 km². Today, it is estimated that 10% of the UGB remains without hydrant serviced, as well as 186 km² outside the UGB. The LFD frontline fleet today includes one (1) less aerial for a total of three (3), as well as two (2) staffed Tankers. To address the inadequate aerial coverage in the west end of the City, the Department is currently redeploying its fleet, which will provide consistent coverage across the City.

While the Engine to Aerial ratio is slightly higher than recommended, the LFD is relying upon its three (3) Quints to supplement the Aerial fleet. The Master Fire Plan produced by Tridata several years ago supports that the City cannot safely operate with less than three (3) Aerials.

With respect to Tankers, the vehicles perform vital functions in support of the operations of the Department. A significant area of the City remains without hydrant services leaving the only option for water supply to structure fires being Tanker shuttles. Further to simply just providing water supply to fire fighting operations in rural areas of the City, these vehicles play a critical role in protecting First Responders at an emergency scene on high speed roadways, particularly the 400 series highways, noting the Occupational Health and Safety Act requires employers to take reasonable precautions to protect employees at risk of injury or death. Heightening the need for such precautions is the Province's mandate that the OPP minimize the closure of these highways with the preference being closing as few lanes as possible because the cost of closure is estimated at \$34 million/hr for the 401 and \$20 million/hr for the 402.

Further to the above, the City freely negotiated permanent staffing on Tankers, noting that the clause goes on to note two (2) and, as such, it fettered its rights. Furthermore, eliminating Tankers and negotiating the purchase of such services is not an option, as the Collective Agreement also contains "no contracting out" language that prevents the service being provided solely by another municipality. Concerning the latter, another issue arises with respect to the timeliness of response in that it can take up to five (5) minutes for volunteer Fire Fighters to get to their station, which is an unavoidable delay. They must then respond from a station that in most cases is farther away than a London station, thereby further contributing to the delay for a water supply. LFD Engines carry 500 gallons of water, while the Quints carry 400 gallons. If only a 1-3/4" line was used, the vehicles could sustain a flow for 5 or 4 minutes, respectively. In the case of a 2-1/2" line, the flow time would decrease to 2-1/2 or 2 minutes, respectively. Therefore, the inherent delays with a contract service are unfeasible.

RECOMMENDED BY:	REVIEWED BY:
JOHN KOBARDA FIRE CHIEF	ROSS L. FAIR EXECUTIVE DIRECTOR COMMUNITY SERVICES



APPENDIX A

APPENDIX “A” – Evolution of LFD Frontline Fleet (Vehicle number represents the station location)

	Pre-2006		2007		2009		2010		2011		2012	
	#	Location	#	Location	#	Location	#	Location	#	Location	#	Location
Engines	9	E1 E2 E3 E4 E5 E7 E9 E10 E12	8	E1 E2 E3 E4 E5 E7 E9 E10	7	E1 E2 E3 E4 E7 E9 E10 (800 g)	6	E1 E2 E3 E4 E7 (800 g) E9	6	E1 E2 E3 E4 E7 (800 g) E14	3	E1 E3 E7 (800 g)
Pumper Rescues	1	PR11	3	PR11 PR12 PR13	4	PR5 PR11 PR12 PR13	5	PR6 PR10 PR11 PR12 PR13	5	PR6 PR8 PR9 PR10 PR11	8	PR2 (Note 1) PR4 (Note 1) PR6 PR8 PR9 PR10 PR11 PR14 (Note 1)
Rescues	2	R1 R2	2	R2 R6	2	R2 R6	2	R2 R6	1	R2	1	R2
Aerials	3	T1 T7 T9	3	T1 T7 T9	3	T1 T7 T9	3	T1 T7 T9	3	T2 T6 T9	3	T6 T7 T9
Quints	2	Q6 Q8	2	Q6 Q8	2	Q6 Q8	3	Q6 Q5 Q12	3	Q5 Q12 Q13	3	Q5 Q12 Q13
Tankers	2	TK 8 TK 11	2	TK 5 TK 11	2	TK 5 TK 11	2	TK 5 TK 11	2	TK 5 TK 11	2	TK 5 TK 11
Cars	2	C1 C2	2	C1 C2	2	C1 C2	2	C1 C2	2	C1 C2	2	C2 C6
Total	21		22		22		22		22		22	

Note 1: Please note that the final deployment will be subject to final analysis