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CITY OF VANCOUVER | 125 YEARS

ADMINISTRATIVE REPORT

Report Date: December 5, 2011
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Meeting Date: December 13, 2011

TO: Vancouver City Council

FROM: Chief of Vancouver Fire and Rescue Services,
General Manager of Engineering Services

SUBJECT: Vancouver Fire and Rescue Services Fleet Additions and Not-Like-For-Like Replacement: Five Vehicles and Two Trailers

RECOMMENDATION

A. THAT Council approve the addition of four vehicles and two trailers to the Vancouver Fire and Rescue Services Fleet and one not-like-for-like vehicle replacement at a total cost of $1,572,000; to be financed from the Truck and Equipment Plant account.

B. THAT the annual capital and operating costs be repaid to the Truck and Equipment Plant Account through incremental annual charges (rental rates) of approximately $198,900 and the Vancouver Fire and Rescue Services Operating Budget be increased by $198,900 effective 2013, subject to the annual operating budget process.

COUNCIL POLICY

Council approves all increases in service levels, including the addition of vehicles and equipment to the fleet.

Council approves expenditures from Reserves, including the Plant and Equipment Plant Account.

SUMMARY AND PURPOSE

The purpose of this report is to seek Council approval to replace an existing compact panel van with one high-roof cargo van and add the following units to the Vancouver Fire & Rescue Services fleet:

- one utility trailer for the Public Fire Extinguisher Education Program;

- one 10-ton cube van to support Emergency Operations and the Heavy Urban Search and Rescue Team;
- one flat-deck trailer to support the Dedicated Fire Protection System Program;
- one custom-designed-chassis vehicle for the Special Operations Team; and
- two medic trucks.

BACKGROUND

Vancouver Fire and Rescue Services (VF&RS) serve a population of approximately 630,000 people in the City of Vancouver, the University Endowment Lands, and the Port of Vancouver. The primary roles of the department include the provision of fire and life-safety education, emergency response, fire prevention, code enforcement, emergency preparedness and acting as the lead agency for the City of Vancouver Heavy Urban Search and Rescue (HUSAR) team. These roles are performed by 811 VF&RS staff, located in 20 fire halls and 3 supporting facilities that are strategically placed around the City. In 2010, VF&RS responded to 47,400 incidents, performed 11,500 safety inspections, and the total estimated fire losses within the City were $21.4 million.

For many years, VF&RS has managed to meet changing and increased demand for service without adding to the fleet. This has been achieved through efficiency gains by pooling light vehicles and designating some units such as the Special Operations/HazMat vehicle, as a 'dual-purpose' unit. Also, by encouraging participation in the City-wide car-share program, VF&RS was able to replace administrative vehicles with pickup trucks that could respond to emergencies at a lower running hour cost and environmental impact than traditional fire engines or ladder trucks instead of replacing them with similar vehicles when the scheduled replacements were due. While this report requests additional units to meet the department's requirements, VF&RS continues its ongoing commitment to seek fleet efficiencies in the future where possible.

FLEET ADDITIONS

In 2007 Equipment Services and Corporate Budgets formalized a procedure for determining the funding mechanism that is used when procuring City-owned vehicles and equipment. The fleet policy is included in Appendix A. Units that are purchased using Truck and Equipment Plant Account funding are units that are either valued at over $15,000, or can be licensed and/or insured, or require an operator to operate the unit from a seated operator's station. Units that are funded using this mechanism must be approved by Council as permanent additions to the City fleet. Units that do not meet any of the criteria above and have a purchase value greater than $300 are purchased using Small Equipment Plant Account funding.

VF&RS has a requirement for four additional vehicles and two trailers to support existing and expanded service levels, which includes Fire assuming the lead role in trench rescue, structural collapse and high-rise building response.

A. <u>Utility Trailer</u>

VF&RS began a formalized Public Fire Extinguisher Training program in 2007. The program trains private citizens, students, businesses and government employees throughout the City of Vancouver to safely operate fire extinguishers and extinguish fires using a realistic

fire scenario. A fire is lit in a controlled setting and trainees practice evaluating the conditions, approaching the fire and safely extinguishing the fire. This program forms part of a comprehensive fire and life safety program as it provides for both workplace safety and home fire-safety training. In the future, this program may be expanded to provide extinguisher training to high school students.

Currently, over 60 training courses are held annually at various locations and worksites throughout Vancouver. The equipment used in the program consists of a burn pan, burn control box, two 20-lb propane tanks, up to 20 fire extinguishers, and various other bulky items. Up until 2009, training equipment was transported to site using a personal van belonging to a staff member. As this practice was not in compliance with Transport Canada's Transportation of Dangerous Goods regulations, which requires ventilation for the propane being carried on board, VF&RS ceased the use of the personal staff van. Since then, the Fire Extinguishing Program has been dependent on the use of a trailer with a roof vent that is assigned to the Heavy Urban Search and Rescue (HUSAR) Team for transporting equipment to training sites.

Sharing the HUSAR trailer has been manageable in the interim, but is not an ideal long term solution. Since both HUSAR and the Fire Extinguisher Program have equipment to transport, it is time consuming and an inefficient use of staff time to swap out equipment between the two teams. Additionally, the HUSAR trailer capacity is much larger than that required for the Fire Extinguisher Program equipment.

Equipment Services (EQS) and VF&RS have examined various options to acquire a trailer for the Fire Extinguisher Program. The options considered were modifying an in-service vehicle, or renting or purchasing an additional vehicle. Modifying an in-service vehicle is not a feasible option, as VF&RS does not currently have a vehicle available that would meet the scheduling and transport needs of the program.

Acquiring an additional utility trailer was then examined. This option would allow for easy storage and transportation of the training equipment. Purchasing a City-owned utility trailer would cost VF&RS $1,000 in annual capital payments per year, compared to $2,400 for rental costs (based on one to two training sessions per week). Purchasing a City-owned 4' x 6' utility trailer at approximately $10,000 one-time capital cost is recommended as it is $1,400 per year less than renting, and will meet the payload, ventilation and storage requirements of the training program. Furthermore, VF&RS has two pooled vehicles that are able to tow this size of trailer, so no additional vehicles are required.

B. Heavy Urban Search and Rescue Cube Van

Background

In 1995, as part of Federal Government Joint Emergency Preparedness Program (JEPP) under Public Safety Canada (PSC), the City of Vancouver established a Heavy Urban Search and Rescue Team. This team can be deployed on short notice in response to local, regional and international disasters. The team is known as "Canada Task Force 1 Vancouver" (CAN TF1) has VF&RS as the lead and includes various City of Vancouver employees trained to locate trapped persons in collapsed structures and other entrapments using specially trained dogs and electronic search equipment. The team

stabilizes, breaches, shores, lifts and removes structural components, using hand tools, and heavy construction equipment to remove victims. The team also includes British Columbia Ambulance Service personnel who provide medical aid for victims. To support HUSAR training and operations, a new HUSAR facility was opened on the VF&RS Training Division site in May 2011. The HUSAR facility provides space for training and an array of tools, equipment and supplies suitable for light, medium and heavy operational levels as published by the *Canada Urban Search and Rescue Classification Guide*. The inventory stored at the facility amounts to approximately 40,000 lbs of equipment valued at approximately $3 million dollars.

VF&RS has been identified as the lead agency responsible for the administration, training, and maintenance since the inception of the HUSAR Program. In 2003, VF&RS purchased a used 1998 five ton cube van (A9232) for the purpose of supporting emergency operations, training exercises , community events and to support the HUSAR Program in regards to the transport of HUSAR equipment for training and emergency deployments. The cube van was also used as a back-up unit when the department's Medic/Tech Rescue truck was out of service for regularly-scheduled maintenance or repair.

Discussion

The current vehicle is used weekly to support HUSAR equipment needs for training and used several times per year as a back-up unit for other apparatus in for maintenance or repair and is used 4-6 times per year to support the VF&RS commitment to community events such as transporting tents and equipment to VECTOR, and the transport of tables and chairs to support the regularly scheduled "town-hall" community meetings in Fire-halls.

The current vehicle is now 13 years old and requires replacement. Furthermore, the gross vehicle weight capacity of this vehicle has been insufficient and as a result, multiple trips must be made to transport the necessary equipment which results in delayed response to a critical incident. This purchase is not eligible under current JEPP guidelines for capital cost-sharing with the federal government. JEPP funding is available annually to the National Teams in two categories of funding: capital, and operating and maintenance (O&M). VF&RS leases two forklifts, and a 55 foot cargo trailer under the O&M portion of the grant. The high leasing costs of a new ten-ton cargo van would not be approved under JEPP eligibility guidelines due to the cost and current funding limitations.

Equipment Services and VF&RS have examined various options to transport equipment. Options included a large trailer or roll-off container pods. A trailer was not recommended as the department does not have a designated vehicle for use in the event of a HUSAR or special teams high-rise deployment. Not only would it require a large commercial tractor to tow; in addition, timely arrangements could not be made to provide immediate response capability for structural collapse or trench rescue. Towing a trailer requires additional training to meet Work-Safe BC regulations. Container pods were not recommended because the only vehicle the department has that could load the container could not be deployed to a HUSAR event outside of Vancouver, as it supports Vancouver's Dedicated Fire Protection System (DFPS). Container pods would require special outfitting to secure equipment and materials due to the steep angles during loading and unloading

of the DFPS Crane Truck. Drivers would be limited to those having the training to operate a roll off crane truck.

After reviewing the department's emergency response deployment needs, it is recommended that a 10-ton cube van outfitted to transport resources required for emergency response be added to the VF&RS fleet. Depending on the level of response and location of a disaster, the capacity of a 10-ton cube van will be part of a transportation plan to move equipment needed for disaster response locally, within British Columbia, or to other Provinces or Countries.

C. Flatdeck Trailer

Background

The City of Vancouver has a Dedicated Fire Protection System (DFPS) which consists of an independent, seismically engineered water main network and supporting equipment that can be used to provide high volumes of fresh or salt water to fight major fires where the main water system has been compromised or is insufficient. The system relies on an earthquake-proof water main and hydrant system, freshwater cisterns , two salt water pumping stations, as well as portable units that include one hydro sub, one hose truck, three hose pods, and one crane truck and over three miles of five-inch hose.

Discussion

The crane truck is currently used to transport the hydro sub and hose pods to a site. A hydro sub consists of a power supply and a portable pump that can draft from open water sources, such as an ocean or lake, to transport large volumes of water. Hose pods are protective compartments that hold one mile of hose, portable hydrants, and other tools and equipment to support the hydro sub. Since both the hydro sub and hose pods are too large to fit onto the truck at once, a minimum of two trips must be made to establish a portable water supply at a site.

The hydro sub unit is generally transported first and once on site, the unit is lifted off of the crane truck and placed on a stationary platform during use. The crane truck then makes a second trip to pick up and deliver the hose pods. This setup is not ideal as it requires staff to make two trips, which takes twice as long to set up a site and have it operational. It also causes increased fuel use and emissions. Additionally, having the hydro sub unit on a stationary flat-deck is not desirable as it cannot be easily moved if environmental conditions, such as wind direction and tides, require the unit to be re-positioned.

The Hydro sub must be run monthly to ensure operability; currently this is done on location at the VF&RS Training Division. Having the ability to efficiently move the hydro sub and hose pods will allow VF&RS to conduct annual off-site exercises at several of the identified drafting points located on the Fraser River, as well as Trout Lake, Lost Lagoon, Coal Harbour and False Creek.

Adding a purpose built flat-deck trailer to the VF&RS fleet is therefore recommended to address the response time and on-site mobility issues of the hydro sub and hose pod

components of the DFPS. The hydro sub would be mounted on the flatdeck trailer, allowing the crane truck to now carry the hose pods while towing the hydro sub in one trip. The flat-deck trailer would also enable faster repositioning of the hydro sub power unit if required as the crane truck, or other available tow vehicles, could reposition the trailer. Therefore, the purchase of a trailer is the best option available for effectiveness and functionality, given its proven performance by other jurisdictions using similar equipment.

D. Special Operations/High-Rise Response Vehicle

Background

Since 1995 VF&RS has maintained a Technical Rescue Team, consisting of a group of cross-staffed firefighters that are trained and qualified to meet National Fire Prevention Association (NFPA) and WorkSafe BC standards. The team provides emergency response to high angle and confined space incidents. Historically, technical rescue's performed by the team only included rope rescue off of high structures, and confined space rescue. The equipment required for these types of rescues include ropes, harnesses, special gas detectors, supplied air, ventilation and communications equipment.

After amalgamation with University Endowment Lands Fire Department in 1995, the Technical Rescue team utilized a 1991 GMC cube van (A9223) owned and licensed by University of British Columbia (UBC). The original purpose of this vehicle was to support a fire extinguisher program delivered by VF&RS to UBC. After a brief period of time, the program ended and rather than return the vehicle to UBC, it was retained to support the Technical Rescue Team. After more than a decade of service, the vehicle had reached the end of its life cycle and was decommissioned during 2009. With authorization from EQS, the Technical Rescue team then utilized a 5-ton cube van (A9207) which was originally used as a HazMat tender that had been replaced. The intent was to allow VF&RS to continue supporting the Technical Rescue team until after the Olympics and to allow the department time to develop a needs assessment and business case to pursue a purpose built vehicle.

Following the Olympics in early 2010, VF&RS implemented its new staffing and apparatus deployment model, aimed at improving the delivery of cost effective emergency services by reducing the use of heavy fire apparatus responding to medical calls. This new deployment model involved repositioning apparatus in various firehalls and using the same amount of staff more efficiently by having firefighters cross-staff more than one emergency response vehicle. The Technical Rescue team was moved from Firehall 7 to Firehall 1 to take advantage of the close proximity to Chess Street Training Center and the HUSAR facility, both being located at the same site. There was a restructuring of the roles and responsibilities of both HUSAR and Technical Rescue and as a result the Technical Rescue team was renamed Special Operations. The redeployment of apparatus included re-outfitting a Rescue truck intended for medical emergencies and auto extrication to include Technical rescue (high-angle), confined space and then repositioned and cross-staffed at Firehall 1.

In 2010, the scope of the Technical Rescue Team expanded to include a first response capability to structural collapse emergencies in the City of Vancouver where the team now known as "Special Operations" would complete a needs assessment, stabilize the scene,

search and confirm live victims, begin search and rescue operations and if required, direct and provide logistic and resource planning at a structural disaster scene.

In 2011, trench rescue also came under the responsibility of the Special Operations team to ensure that resources were in place to perform rescues of injured or trapped workers as legislated by Work-Safe BC. These expanded responsibilities require team members to obtain additional training and equipment that must be transported with the team. This equipment includes large pieces of mechanical and wooden shoring which are used to stabilize and prevent further collapse of structures or excavations, trenches or other geological failures.

Current Practice

Currently, only part of the necessary equipment and tools required by the Special Operations Team is transported to the site on a Rescue truck which has no further capacity for additional equipment due to both weight and volume. Additional equipment is stored at various locations throughout the City and must be brought to the emergency site using other apparatus. This is an inefficient use of resources which results in a considerable delay and further impacts the response availability of those apparatus and crews used to transport the equipment.

Operational Requirements

A Special Operations emergency response truck plays a critical support role at emergency scenes. Compartments are configured with roll out shelving and lifting devices capable of storing large quantities of equipment used in structural collapse and scene stabilization, trench rescue, water rescue, confined space, technical rope rescue and high-rise operations in tall buildings The truck will be equipped with a large generator, light tower, high pressure compressor and an air fill station to refill self contained breathing apparatus bottles at fire scenes. It will also contain the necessary equipment to comply with Work-Safe regulations regarding rehabilitation and re-hydration support during fire-fighting or special operations.

VF&RS only has one Air and Light unit that supports crews in this way and it becomes a logistical challenge when there are concurrent emergencies in the City. This situation of concurrent emergencies now occurs more frequently than in past as the existing air/light unit has ‘down-time’ for both scheduled and unscheduled maintenance or repair. As well, the main function of this unit will be to act as an air supply to specially designed connections in the stairwells of newer high rises. Finally, many of the rescue/medic units no longer carry additional air bottles given their mission is to respond to medical emergencies in the most efficient and timely manner.

Currently, when the air and light unit is unavailable, air bottles must be refilled at designated firehalls and transported to and from the emergency scene by available apparatus resulting in considerable delays and impact to emergency operations. Having a second unit capable of re-filling air bottles and providing a re-habilitation area for firefighters will provide increased capabilities for VF&RS operations and serve as a back-up when the dedicated air and light unit is in for scheduled maintenance or repairs.

Utilization

VF&RS Special Operations respond to a number of events where the availability of a multi-purpose Special Operations vehicle would be beneficial. Examples of response plans for this vehicle include, but not limited to:

- Technical rescue response where rope rescue of victims from high angle locations, (structures, bridges, cliffs, trees) and low angle (gulleys, banks) including bi-weekly (approximately 80 per year inclusive of all discipline areas of special operations) training exercises and approximately 4-6 technical rescue emergency responses per year.

- Structural Collapse response to assess, stabilize, locate and rescue victims of structures who have suffered degradation, instability or total collapse by environmental, fire, seismic activity, or by accidental, criminal or terrorist forces. Training exercises are scheduled bi-weekly for structural collapse and it is anticipated that the unit will provide emergency response to an average of 2-4 structural collapse calls per year.

  Trench Rescue responses to the collapse or degradation of man-made or natural geological formations to assess, stabilize, locate and rescue victims. Training exercises are scheduled bi-weekly for trench rescue and it's anticipated the unit will provide emergency response to an average of 2-4 trench rescue calls per year.

- Confined space response to permitted (identified and registered by COV OHS, BC Hydro and Fortis, and Telus) confined spaces in the City of Vancouver. Permitted confined spaces are identified by industry in the City of Vancouver as well as non-permitted confined spaces as created privately by citizens, or by natural, criminal or terrorist force. Utilization includes bi-weekly scheduled special operations training exercises and an anticipated 2-4 confined space responses per year.

- High-rise operations response to support emergency operations in buildings or structures over 6 stories in height. Including the supply of electric power for forced entry and breaching equipment, ventilation, and lighting, air support for filling of self contained breathing apparatus, air supply for pre-plumbed high rise air lines, pneumatic tool support including lift bags, hydraulic systems support rescue tools as well as rehabilitation and re-hydration equipment. Utilization includes monthly scheduled drills and an anticipated 100 emergency responses per year.

In summary, it is expected that the Special Operations emergency response vehicle will be utilized over 150 times per year for training and emergency calls.

During routine maintenance of the department's Air and Light Support Unit, this new Special Operations unit can backfill and provide support for air, lighting needs and firefighter rehabilitation during an event.

The recognized benefits of a multi-purpose Special Operations vehicle is utilized by other similar sized neighboring jurisdictions. The City of Burnaby is at the procurement stage, while Coquitlam and Calgary fire departments operate two vehicles each with

configurations that meet many of the same objectives. All of these units were built using custom chassis.

It is recommended that a custom truck chassis with special compartments to house expensive technical equipment be dedicated to support the Special Operations Team. Commercial trucks are not able to meet these operational requirements regarding a safe design for the rapid response and deployment of the apparatus, crew and equipment. Commercial cabs are not spacious enough to contain the necessary communications equipment, work station, gas detectors, mobile data terminal and storage of personal protective equipment.

Conceptual drawing of a Special Operations Hi-Rise Response Vehicle; See appendix C

E. **Medic Trucks**

VF&RS has an operational need for two 4-wheeled drive light pickup trucks which will be used as medic trucks. Medic trucks provide emergency response to fire, rescue and medical calls. Of the 47,400 incidents responded to by VF&RS in 2010, 63% were medical calls.

Background

Previously, firefighters were responding to medical calls on large suppression apparatus such as ladder trucks, engines as well as rescue trucks depending on the availability of the apparatus. During the Olympics, a need for smaller vehicles was identified in order to attend to emergencies in the crowded and busy downtown core with traffic restrictions. Two existing medium duty vehicles originally dedicated to forest firefighting were used during the event to navigate through the busy downtown streets and restricted laneways. The results were a resounding success in terms of the speed that firefighters could reach a scene and in terms of operational savings achieved through a reduction in accidents and fuel costs that are associated with using a large apparatus.

Current Practice and Experience

After the success of this pilot during the Olympics, VF&RS reviewed their operations and determined that a better way to provide emergency response services could be achieved by reducing the use of ladder trucks or engines to respond to medical emergencies by cross-staffing. In May of 2010, VF&RS implemented its new staffing and apparatus deployment model, aimed at improving the delivery of cost effective emergency services by reducing the use of heavy fire apparatus responding to medical calls. This new deployment model involved repositioning apparatus in various firehalls and using the same amount of staff more efficiently by having firefighters cross-staff more than one emergency response vehicle. To further meet the efficiencies achieved by the cross-staffing model, the only reserve rescue truck was placed in active duty. A reserve truck is a back-up unit deployed when an active duty rescue is taken out of service for maintenance or repair, or for special events. When this unit is required as a back-up for others requiring maintenance or repair, it is repositioned from the Firehall that it was assigned to and subsequently, that Firehall must revert to responding with heavy apparatus. Due to the maintenance and repair schedule of the other rescue trucks, it's actively used throughout the year.

In 2010, and to further expand the cross-staff model, approval was received to replace three administration vehicles with three medic pickup trucks through a NLFL process. The medic pickups were stationed in the halls based on most efficient deployment to the medical calls. The use of these pickup trucks has significantly reduced the number of medical calls that large apparatus respond to.

Discussion

In line with this model of deployment, VF&RS has determined that another two medic trucks can provide further opportunities for operational savings by 'right-sizing' of units to the type of calls and to provide additional deployment flexibility when vehicles (e.g., Rescues, Battalion Chief vehicles) are out of service for repair or scheduled maintenance.

The approximate annual rental rate (both capital repayment to the Plant account and maintenance) for these two medic trucks is $28,200. Reduction in fuel, maintenance and accident repair costs can be achieved by using the medic trucks instead of large apparatus to respond to medical calls in terms of fuel, maintenance, and repairs. VF&RS anticipates the ability to provide a full offset to these increased costs through a reduction in annual fuel expense. While there are maintenance savings as well, due to the strains on the maintenance budget to meet existing needs, a reduction from this source is not recommended by VF&RS staff.

In addition to the anticipated fuel savings, there are operational benefits as well. The turnout time for staff to enter the vehicle and leave the hall is much quicker (estimated 15-20 seconds) than for a larger truck. During inclement weather, 4-wheel drive units will be safer and more maneuverable on City streets and will preclude the use of snow chains in most cases, which will improve response times. For medical emergencies when every second counts, VF&RS strives to maintain National Fire Prevention Standards of a four minute response time from the time when the truck leaves the fire hall.

Reducing the risk of accidents involving large apparatus means less downtime of these units. Downtime increases the usage and maintenance requirements of Reserve and Greater Alarm units, reduces the availability of units for training purposes, and causes additional staff time to reallocate resources when units go out-of-service. Reserve apparatus are used to back-fill other front-line emergency response apparatus that are taken out-of-service for maintenance or repair. They are also used for training purposes and staffed for small to large scale special events. Greater Alarm apparatus are stationed in Firehalls and are fully equipped to be staffed in the event of larger scale emergency responses where many vehicles and crews are assigned. Because of the low number of Reserves and an aging fleet, Greater Alarm apparatus are regularly put into service for emergency response.

In summary, there are measurable benefits, through expected fuel savings and by providing quicker and "right-sized" response to emergency calls.

NOT-LIKE-FOR-LIKE REPLACEMENT

In 2007 Equipment Services and Corporate Budgets established a Vehicle and Equipment Replacement Process to define the two types of equipment replacements and the approval

method for each. The fleet policy is included in Appendix B. The first type, a "like-for-like" replacement, applies when the new unit is similar in class, cost, or operational usability to the existing unit in the fleet. The financial implications of the "like-for-like" replacement are submitted to Corporate Budgets for concurrence and approval.

In cases where the characteristics listed above differ, a "not-like-for-like" (NLFL) replacement approval is required. The approval method for the NLFL replacement depends on whether the usability and the incremental capital and operating costs are within limits set out in the fleet policy. NLFL replacements that are within the policy limits can be directed to Corporate Budgets for approval. Council approval is required for NLFL replacements that are outside of the limits because the replacement units differ significantly in cost or use (service level) compared to the unit originally approved by Council.

VF&RS has a requirement for one NLFL replacement of a panel van with a high-roof cargo van for the Fire Investigation Team that requires Council approval. The service level has not expanded but the type and cost of the new vehicle exceeds the tolerance limits and therefore requires Council approval.

High Roof Cargo Van

VF&RS currently has two vehicles used by their Fire Investigation Team. The primary investigation unit, C9236, is a light panel van that is used as a mobile base for the on duty Fire Investigator to conduct investigations. It can be onsite at an investigation for extended periods from hours to days depending on the scale of the investigation. The second unit, B9221, is a compact panel van that is used by the Captain of Fire Investigation to respond to incidents when the primary vehicle is deployed or when the on-duty investigator requests assistance.

The primary investigation unit, C9236, is currently not able to transport or adequately store all of the equipment and evidence that is required for an investigation. The equipment required to analyze and to store evidence has become increasingly more specialized and may include but is not limited to: chemical and gas detection analyzers, air cart for self contained breathing apparatus, an evidence kit, cameras and radio equipment, a portable generator, scene lighting, and a wide variety of tools such as saws, drills, shovels, shop vac, ladders, hatchets and wrecking bars.

The payload and space capacity available on the current vehicle is insufficient for the following reasons:

- The fire investigator is not able to transport a mobile air cart and self contained breathing apparatus, therefore this equipment is currently transported in an additional vehicle which ties up an extra staff member and uses up additional resources.
- There is an increased risk of cross-contamination of evidence, work gear and equipment since there are limited compartments to segregate these items.
- A delayed response occurs when specialized electronic equipment is loaded and unloaded for recharging, since there is an inadequate electrical power distribution capacity for on-board charging.
- There is insufficient space within the van to process evidence and conduct interviews.

For the reasons stated above, it is therefore recommended that the Fire Investigation team acquire a high roof cargo van, with a larger cargo capacity to allow for additional equipment storage and a work area.

Unit C9236 is not scheduled for replacement until 2014, therefore it is recommended that the second Fire Investigation vehicle, unit B9221 which is at the end of its serviceable life, be replaced with a high roof cargo van that will meet the needs of the Fire Investigation Team. Unit C9236 will then be utilized by the Fire Investigation Captain, and upon replacement will be right-sized to a smaller vehicle to meet the ongoing needs of the Fire Investigation Team.

FINANCIAL IMPLICATIONS

The expected service lives, one-time capital costs, and operating budget requirements of the proposed additions and not-like-for-like replacement are listed in Table 1 below along with any associated offsets and the resulting net operating budget impact.

The one-time capital costs of $1,572,000 will be provided from the Truck and Equipment Plant Account.

The addition of the six units, the equipment and inventory for the Special Operations Vehicle, and the not-like-for-like replacement of unit B9221 will result in net annual capital and operating costs of approximately $232,800. This cost is anticipated to be offset by annual savings of approximately $33,900 realized through reduced usage of larger apparatus ($28,200) and reduced operating requirements for repurposed C9236 ($5,700). The resulting net annual operating budget increase required as a result of the fleet additions and NLFL replacement is therefore estimated to be $198,900 effective 2013, subject to annual budget review. The minor, part-year costs for the utility trailer and two medic trucks that may be in-service by Q2, 2012 will be absorbed within Fire's 2012 operating budget without offset.

Table 1. Vehicle Life, One-Time Capital, Annual Operating Costs and Associated Offsets.

Vehicle Description	Life (years)	One-Time Capital Costs	Annual Operating Budget Requirements			Offsets
			Capital	Operating	Subtotal	
Utility Trailer	15	$10,000	$1,000	$1,000	$2,000	$0
HUSAR Cube Van	15	$160,000	$16,500	$5,800	$22,300	$0
Flatdeck Trailer	15	$15,000	$1,600	$1,000	$2,600	$0
Special Operations: - Vehicle - Equipment & Inventory	 15 7	 $825,000 $325,000	 $83,500 $58,000	 $10,400 $0	 $93,900 $58,000	 $0 $0
Medic Truck	10	$62,000	$8,000	$6,100	$14,100	($14,100)
Medic Truck	10	$62,000	$8,000	$6,100	$14,100	($14,100)
High-Roof Cargo Van	10	$113,000	$14,500	$11,300	$25,800	($5,700)
Subtotal		$1,572,000	$191,100	$41,700	$232,800	($33,900)
Net Increase					**$198,900**	

The total one-time capital cost of $1,150,000 for the Special Operations Vehicle represents the cost of acquiring and outfitting the unit to a state ready for deployment. The equipment

and inventory components for the Special Operations Vehicle are shown separately in Table 1 because of their shorter service life and capital recovery (amortization) period. These components are for specialized small equipment such as saws, breakers, and shoring that will be required for the operations as described in the sections above.

PERSONNEL IMPLICATIONS

There are no personnel implications.

ENVIRONMENTAL IMPLICATIONS

All new and replacement equipment in the City fleet go through an environmental and right-sizing review process. This is to ensure that the equipment will meet the user's operational needs and that the selected equipment has the best combination of fuel efficiency and cost effectiveness. The addition of these units will produce roughly 31 tonnes of GHG annually. Table 3 shows the GHG generated by each class of vehicle.

Vehicle Description	Average Annual Mileage (km)	Fuel Economy (L/100km)	Annual GHG (tonnes)
Utility Trailer	-	-	0
Flatdeck Trailer	-	-	0
High-Roof Cargo Van	3,000	21	2
Special Operations Vehicle	750	979	20
HUSAR Cube Van	1,000	55	1
Medic Truck	6,400	26	4
Medic Truck	6,400	26	4
TOTALS			31

The options that were considered for these vehicles included liquefied natural gas (LNG), compressed natural gas (CNG), electric, gasoline, and diesel.

Of these options, the LNG and CNG options are not feasible. The natural gas fuelling infrastructure is limited and in some cases unavailable. Maintenance and reliability are also a concern, and therefore not recommended for emergency response vehicles.

Though, electric vehicles are available for certain vehicle types and produces zero tailpipe emissions, the cost for an electric unit is still prohibitively high since the payback on electric vehicles with low mileage makes it uneconomical.

Gasoline and diesel powered vehicles meeting the latest regulatory emission requirements are the recommended options for these additions as fuel sources are readily available, operational needs of emergency operations are met and best value is provided for the application.

Trailers
The two trailers do not consume any fuel and therefore, will not contribute to the emission of GHGs. The flatdeck trailer is expected to reduce the amount of GHG produced since it will reduce the number of trips necessary for the crane truck to set up the components of the DFPS from two to one.

HUSAR Cube Van
The only available engine option of a vehicle in this class is diesel. The vehicle will run on a biodiesel blend of 5% and will produce 2-tonne of GHG annually.

Special Operations/High-Rise Response Vehicle
Given the heavy duty operation of the Special Operations Vehicle, a custom chassis is required and will run on a biodiesel blend of 5%. This vehicle will generate roughly 20 tonnes of GHGs annually.

Medic Trucks
The medic trucks provide a more fuel efficient way of responding to emergency calls received and alleviates the need for large specialized apparatus such as ladder trucks and engines to respond to medical emergencies. The proposed medic trucks will be gasoline powered which is more suitable to the operation than diesel powered trucks. The fuel economy of medic truck is 96% more efficient than a ladder truck and is 98% more efficient than a rescue. The two (2) medic trucks are expected to produce eight tonnes of GHGs annually.

High Roof Cargo Van
The cost for a diesel cube van is estimated to be $113,000 and represents a $12,000 premium over the most economical gasoline option. A diesel engine is estimated to produce 24% less GHGs than a gasoline model for this particular application.

Given the specific purpose and low mileage of this van, a diesel engine estimated to produce one tonne of GHG annually, is the recommended option because it best satisfies the goals of reducing emissions, leading the way on sustainable fleet practices, providing best value, and supporting operations.

CONCLUSION

To support existing and expanded service levels, including Vancouver Fire & Rescue Services assuming the lead role in trench rescue, structural collapse and high-rise building response, staff recommend the addition of one utility trailer, one 10-ton cube van for HUSAR, one flatdeck trailer, one custom chassis for the Special Operations Team, and two medic trucks to the Vancouver Fire and Rescue Services fleet, as well as the not-like-for-like replacement of an existing compact panel van with one high-roof cargo van. The one-time capital costs of $1,572,000 for these units will be allocated from the Truck and Equipment Plant Account. Staff also recommend that the associated annual operating costs of $198,900 be added to the VF&RS Operating Budget effective 2013, subject to the regular annual budget review process.

* * * * *

APPENDIX A - EQUIPMENT SERVICES POLICY
4.1.2 Procurement - Funding of Vehicles and Equipment

Equip	**POLICIES AND PROCEDURES** **Equipment Services**	
Category: Operations	Subject: Procurement - Funding of Vehicles and Equipment	Policy Number: 4.1.2

Funding Mechanism - City-Owned Vehicles and Equipment

Purpose
To set out a procedure for determining which of the Equipment Service Branch administered funding mechanisms will be used for the procurement of city-owned vehicles and equipment.

Scope
This policy applies to all City owned vehicles and equipment that are inventoried and tracked by the Equipment Services Branch.

Procedures
In order for a vehicle or piece of equipment, herein known as a "Unit", to be funded from the Truck and Equipment Plant Account, the Unit must meet the following conditions:

- Be a permanent addition to the corporate fleet via a Council approved Administrative Report that has been concurred with by both the Equipment Services Branch and Corporate Budget Services.
- Unit maintenance history must be collected in the City Fleet Management System.
- Must be procured by Equipment Management staff.

In order for a Unit to be funded from the Small Equipment Plant Account, the Unit must meet the following condition:

- Unit maintenance history must be collected in the City Fleet Management System.
- Must be procured by Equipment Management staff.
- Must be a serviceable item that is placed on regular preventative maintenance schedule that will be maintained by the City (which will include VFRS).

The table below lists the criteria used to determine the appropriate funding mechanism for the procurement of City-Owned vehicles and equipment.

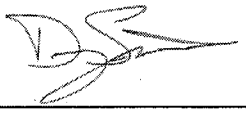
Funding Mechanism	
Truck & Equipment Plant Account	**Small Equipment Plant Account**
Any City-Owned Unit worth over $15,000 at time of procurement.	Any City-Owned Unit that does not meet Truck and Equipment Plant Accounting funding mechanism criteria and has a purchase value greater than $300.
Any City-Owned Unit that can be licensed and/or insured.	
Any City-Owned Unit that requires operator to operate the Unit from a seated operator's station.	

*Unit is defined as a vehicle or piece of equipment that incorporates mechanical technology.

Additional Notes
The Equipment Services Branch is responsible for administering the Truck and Equipment Plant Account and the Small Equipment Plant Account and evaluating fleet requirements and technologies funded from this funding source.

Both the Truck and Equipment Plant Account and the Small Equipment Plant Account are part of the Truck and Equipment Reserve Fund.

Any Units not defined by the criteria listed above shall be reviewed by the Manager of Equipment Services to determine the appropriate funding mechanism.

Issued by: Mani Deo	**Approved by:** 	**Date:** January 15, 2007

APPENDIX B - EQUIPMENT SERVICES POLICY
4.1.3 Procurement

Equip — Equipment Services
Policy & Procedures Manual

Category: Operations	Subject: Procurement	Policy Number: 4.1.3

Vehicle/Equipment Replacement/Refit Process

Purpose

The Equipment Services Branch is responsible for administering the Truck and Equipment Plant Account. As part of the 2007/2008 Replacement Program process, the Equipment Service Branch was tasked by Corporate Budget Services to document the processes used for replacing vehicles and equipment funded from this funding source.

Scope

This Policy deals with all units funded from the Truck and Equipment Plant Account.

Policy

There are two methods of replacing units funded from the Plant Account. Regardless of the method, the capital costs of the unit (minus estimated resale) must be paid back to the Plant Account in full before the unit can be replaced. Additionally, economic modeling techniques are to be used to determine optimal life of the unit based on maintenance and operating cost history for the class of unit being replaced.

Like for Like Replacement/Refit (LFLR)

The Equipment Services Branch is to ensure the there are sufficient funds available in the Plant Account for a LFLR. A LFLR means that the new unit being procured or refitted is similar in class, size, operational usability, and is of similar financial value of the unit being replaced/refitted.

Financial implications of the LFLR are to be presented to COV Budgets for concurrence before the unit can be replaced/refitted.

Not Like for Like Replacement/Refit (NLFLR)

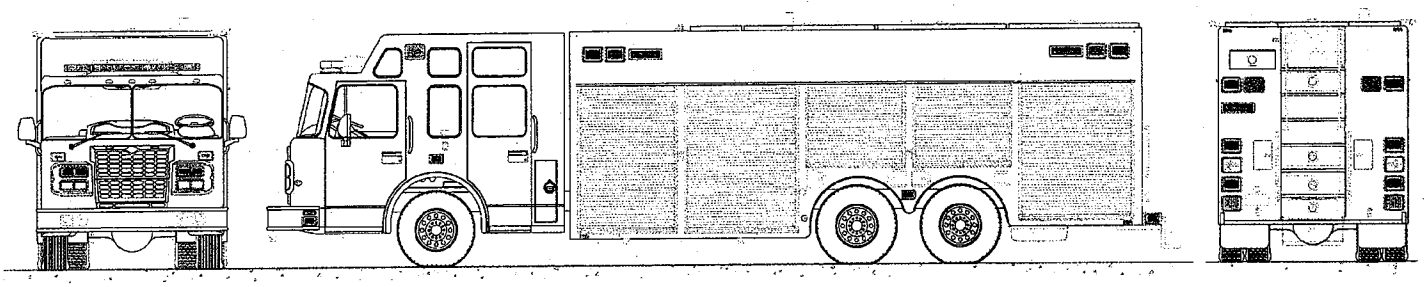
A NLFLR is used in place of LFLR for vehicles and equipment that are need of replacement and differ in class, size, cost or operational use from the unit being replaced/refitted. The NLFLR can be performed when:

- Net annual ownership cost (capital and operating) of the replacement/refitted unit are similar or less than the unit being replaced/refitted and,
- Incremental cost of the replacement unit does not surpass 35% of a LFLR (net outfitting), up to a maximum of $300,000, unless there is demonstrated improvement in operational productivity that decreases operational costs or increase City revenues in excess of the annual increase in fleet costs and,
- The replacement/refit is not a component of a larger change in fleet standard for a particular class of replacement/refit.

If any of the above criteria for NLFLR's are not met, the replacement/refit is to be directed to Council.

Issued by: Mani Deo P.Eng Equipment Management	Approved by:	Date: January 15, 2007 (Revised June 20, 2011)

APPENDIX C - Conceptual Drawing:
Special Operations/Hi-Rise Response Vehicle



Appendix D - Summary of Budget Funding Recovery through Cost Savings

Based on the cost savings identified in Table 1 in the report, the following outlines how these savings will offset the budget required for the Fleet additions.

	2012	2013	2014
***Fuel Savings (includes 7 total cross staffed units)** = Cross staffed Medical Units	**9,450**	18,900	18,900
Maintenance Related Costs **Costs** = Reduction of running hours of larger apparatus	**7,500**	15,000	15,000
Repurposed Smaller Replacement Unit =			

Definitions:
Cross Staffed Medical Unit =The department is utilizing smaller pickup trucks for response to medical emergencies rather than responding with larger Fire Apparatus.

***Includes multiple initiatives to achieve Fleet efficiencies**