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CITY OF VANCOUVER | 125 YEARS

ADMINISTRATIVE REPORT

Report Date: June 20, 2012

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Meeting Date: July 10, 2012

TO: Vancouver City Council

FROM: General Manager of Engineering Services

SUBJECT: Fleet Additions - Replace Streets, Traffic and Electrical Operations Leases with City-Owned Units

RECOMMENDATION

A. THAT Council approve the allocation of $1,177,500 from the Truck and Equipment Plant Account to add 18 city owned units to the Streets, Traffic and Electrical Operations fleet to replace 18 existing leases.

B. THAT the annual costs of the vehicles including the asset repayment (for the portion funded from the Truck and Equipment Plant Account), be paid through annual charges of $397,300 with funding to be provided from the existing Streets, Traffic and Electrical Operations budget, and future funding will be managed within the context of the annual budget process.

REPORT SUMMARY

Streets, Traffic and Electrical Operations Branch currently utilize 18 leased vehicles and equipment to supplement their fleet to respond to changing service level requirements. The current annual lease cost to the City is $430,400. The one-time cash purchase cost of the units will total $1,177,500 and will be funded from the Truck and Equipment Plant Account. Over the estimated 10 year life of the vehicles, the City will realize a positive Net Present Value related to the elimination of the lease payments of approximately $1.99 Million. Internally, annual operating budget savings of $276,400 is achieved by converting these leases to City owned units. It is recommended that these 18 leased units be replaced with City-owned units.

COUNCIL AUTHORITY/PREVIOUS DECISIONS

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

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

CITY MANAGER'S/GENERAL MANAGER'S COMMENTS

REPORT

Background/Context

As recommended by the 2004 Truck and Equipment Rental Audit done by the Internal Audit Group, Equipment Services (EQS) reviews all long term leases. The review is based on the operational need for the unit and the cost effectiveness of converting the leases to City owned units. When a review indicates that fleet additions are appropriate, staff seek approval from Council for these additions with initial asset funding to be provided by the Truck and Equipment Plant Account (Plant Account). The Streets Traffic and Electrical Operations Branch (STEO) has an ongoing operational need for 18 units to support street repairs, maintenance and construction.

STEO is currently leasing 18 units of various types. These leases were initiated between 2005 and 2010 to accommodate a reorganization of crews to meet increasing service requests, and to respond to changing service level requirements. In 2012 STEO budget and service level adjustments resulted in reduced capital and operating programs and increased externally funded private or utility based programs. These lease vehicles are required to support the 2012 service level requirements. The STEO fleet is reviewed on an on-going basis to respond to budgetary and service level adjustments. Table 1 provides a summary of the number of vehicles and equipment additions required in the STEO fleet. Additional justification based on program and usage details is available in Appendix A.

Table 1. Streets Traffic and Electrical Operations Services Requiring Additional Vehicles and Equipment

Program & Services	Vehicle & Equipment Type	Qty
Sidewalk Maintenance	One yard dump truck	1
	Cube van with power tailgate	1
Maintenance Concrete Cut Repair	Light pick up truck	1
	One yard dump truck	1
Asphalt Maintenance	Asphalt heater	1
	One yard dump truck	1
Snow Removal	Multi-Utility Vehicle (MUV)	2
	Snow blower	1
	Brine mixer	1
	One yard dump truck	1
Transient	One yard dump truck	1
	Light pick up truck	1
Utility Locator	Heavy panel vans	2
General Operations	One yard dump truck	1
	Bobcat Loader	1
Civil Electrical Crew	One yard dump truck	1
	Total	18

Currently, these vehicles and equipment are funded by charges to various STEO capital and operating programs or charged directly to private or utility customers requiring streets inspection, maintenance or construction services.

STEO reviews their fleet size, equipment needs and utilization on a regular basis. For example this year STEO determined that four (4) additional vehicles could be right-sized to smaller units or decommissioned altogether. These include three (3) three yard dump trucks that will be right-sized to one yard dump trucks and one (1) aerial truck that has low utilization and will be permanently decommissioned. These reviews are done on an ongoing basis as STEO continues to streamline their operation and respond to budgetary and service level adjustments. Fleet changes through right sizing or decommissioning are primarily done at replacement or through attrition to minimize budgetary impacts.

Strategic Analysis

Table 2 compares the cost of the proposed City-owned vehicles versus leasing from outside agencies and shows that owning will result in savings of approximately $276,400 to the annual operating budget.

Table 2. Vehicle and Equipment Information and External Lease Rate vs. Internal Asset Loan Repayment Rate Comparison (for Annual Budget Implications)

Unit	Lease Vehicle & Equipment Class	Leased Start Date (m/d/y)	External Lease Rate/Year	Proposed City-Owned Vehicle & Equipment Class	Internal City Rate/Year*	Potential Savings Per Year
A5596	TRACTOR, MINI, ARTICULATED, MULTI-USE	11/19/2010	$ 81,000	TRACTOR, MINI, ARTICULATED, MULTI-USE	$ 18,200	$ 62,800
A5576	TRACTOR, MINI, ARTICULATED, MULTI-USE	11/19/2010	$ 132,000	TRACTOR, MINI, ARTICULATED, MULTI-USE	$ 18,200	$ 113,800
A5489	TRUCK, DUMP, 1 YARD	6/10/2008	$ 19,100	TRUCK, DUMP, 1 YARD	$ 10,800	$ 8,300
A5490	TRUCK, DUMP, 1 YARD	5/29/2008	$ 19,600	TRUCK, DUMP, 1 YARD	$ 10,800	$ 8,800
A5491	TRUCK, DUMP, 1 YARD	6/13/2008	$ 23,200	TRUCK, DUMP, 1 YARD	$ 10,800	$ 12,400
A5492	TRUCK, DUMP, 1 YARD	6/17/2008	$ 16,700	TRUCK, DUMP, 1 YARD	$ 10,800	$ 5,900
A5494	TRUCK, DUMP, 1 YARD	6/9/2008	$ 19,800	TRUCK, DUMP, 1 YARD	$ 10,800	$ 9,000
A1205	TRUCK, DUMP, 1 YARD	1/0/1900	$ 17,500	TRUCK, DUMP, 1 YARD	$ 10,800	$ 6,700
A5351	TRUCK, PICKUP, LIGHT	3/7/2005	$ 7,200	TRUCK, PICKUP, LIGHT	$ 6,500	$ 700
A5352	TRUCK, PICKUP, LIGHT	3/7/2005	$ 7,200	TRUCK, PICKUP, LIGHT	$ 6,500	$ 700
A5509	TRUCK, VAN, POWER TAILGATE, SINGLE AXLE	1/27/2009	$ 15,500	TRUCK, VAN, POWER TAILGATE, SINGLE AXLE	$ 7,900	$ 7,600
A1901	VAN, PANEL, HEAVY	10/21/2009	$ 12,200	VAN, PANEL, HEAVY	$ 3,600	$ 8,600
A1904	VAN, PANEL, HEAVY	12/1/2009	$ 12,200	VAN, PANEL, HEAVY	$ 3,600	$ 8,600
A5425	TRUCK, DUMP, 1 YARD	10/12/2006	$ 16,400	TRUCK, DUMP, 1 YARD	$ 10,800	$ 5,600
A5541	CONSTRUCTION LOADER, SKIDSTEER	1/6/2010	$ 30,800	CONSTRUCTION LOADER, SKIDSTEER	$ 13,900	$ 16,900
TOTALS			**$ 430,400**		**$ 154,000**	**$ 276,400**

*Internal City Rate/Year is equivalent to the annual asset loan repayment.

These savings will flow through equipment costs into Capital, Operating and Utility projects and will automatically be reflected in future budgets.

Implications/Related Issues/Risk (if applicable)

Financial

The City currently expends $430,400 per year on the lease costs for the vehicles. The one time expenditure to purchase the vehicles will be $1,177,500. With the elimination of the lease costs, the City will realize a positive Net Present Value of approximately $1.99 million over the estimated 10 year life of the vehicles.

The cost breakdown of the proposed City-owned units, including the estimated one-time asset costs and annual budget requirements are shown in Table 3.

Table 3. One-Time Asset Costs and Annual Budget Requirement

Unit	Proposed City-Owned Vehicle & Equipment Class	Life [yrs]	One-Time Asset Costs	Annual Budget Req.		
				Asset Loan Repayment*	Ongoing Asset Cost**	Subtotal
A5530	Snow Blower	20	$0	$0	$2,500	$2,500
A5514	Asphalt Heater	10	$0	$0	$6,500	$6,500
-	Brine Maker	20	$0	$0	$300	$300
A5596	MUV	10	$141,000	$18,200	$40,000	$58,200
A5576	MUV	10	$141,000	$18,200	$40,000	$58,200
A5489	1 Yard Dump	10	$83,500	$10,800	$12,900	$23,700
A5490	1 Yard Dump	10	$83,500	$10,800	$12,900	$23,700
A5491	1 Yard Dump	10	$83,500	$10,800	$12,900	$23,700
A5492	1 Yard Dump	10	$83,500	$10,800	$12,400	$23,200
A5494	1 Yard Dump	10	$83,500	$10,800	$12,900	$23,700
A5425	1 Yard Dump	10	$83,500	$10,800	$13,300	$24,100
A1205	1 Yard Dump	10	$83,500	$10,800	$12,900	$23,700
A5351	Light Pickup Truck	10	$50,000	$6,500	$8,700	$15,200
A5352	Light Pickup Truck	10	$50,000	$6,500	$8,700	$15,200
A5509	Cube Van, Power Tailgate	10	$61,000	$7,900	$15,200	$23,100
A1901	Heavy Panel Van	10	$27,500	$3,600	$7,600	$11,200
A1904	Heavy Panel Van	10	$27,500	$3,600	$7,600	$11,200
A5541	Skidsteer, Loader	8	$95,000	$13,900	$16,000	$29,900
Totals			**$1,177,500**	**$154,000**	**$243,300**	**$397,300**

*Asset Loan Repayment calculation includes purchase and outfitting costs, plus interest less the anticipated resale based on expected depreciation over the life.
**Ongoing Asset Cost include insurance, fuel, and maintenance on an annualized basis

There are no 2012 asset cost implications for the asphalt heater, brine making system, and snow blower as these units no longer have any outstanding asset costs remaining. A one-time expenditure of $1,177,500 for the remaining 15 units requiring purchase will be provided from the Truck and Equipment Plant Account. When the units are replaced at the end of their economic lives, the full one-time asset cost will be provided by the Truck and Equipment Plant Account and will be repaid over the expected lives of the units through the usual asset amortization contribution. The snow blower will not be replaced at the end of its life.

The total annual budget requirement for the 18 units is estimated to be $397,300 and includes asset repayment (for the portion funded from the Truck and Equipment Plant Account), maintenance, fuel and insurance. This will be funded by the existing 2012 STEO Operating and Capital Budgets as equipment is commissioned and future funding will be managed within the context of the annual budget process. The annual budget equipment savings related to the elimination of the lease costs and replacement with the internal loan repayment costs will be $276,400 and are anticipated to be fully realized in 2013. The savings will be reflected in future EQS rental rates.

Environmental - Equipment

All new and replacement equipment in the City fleet go through an environmental and right-sizing review process. This is to ensure that the selected equipment meets the goals of supporting operations, providing best value, and leading the way on sustainable fleet practices and meeting the City's GHG and emission reduction targets. The cumulative reduction in GHG's due to these proposed changes is 4.95 tonnes / year (see table in Appendix B).

Asphalt Heater

The asphalt heater is available in both biodiesel and propane configurations. The smallest propane fired engine is able to maintain heat levels utilizing six (6) times less energy than the smallest biodiesel engine. When compared to the bio-diesel model, the propane model also produces 5% less green house gases (GHGs). For these reasons a propane model was selected.

Furthermore, by eliminating the need to recycle virgin asphalt and reducing the amount of transport required, an additional 2.1 tonnes of GHG production will be eliminated annually.

Snow Blower

The unit is powered by an 8.2 L diesel engine and operates on a biodiesel blend of 5%. The usage on the unit is dependent upon the amount of snow that falls each season and as such will vary year to year. It is estimated that up to one (1) tonne of GHG will be produced with each major snow fall requiring snow removal.

Brine Mixer

The brine mixer is hardwired to the electrical system at National Yards to produce brine on site and thus will cause minimal lifecycle GHG emissions. GHG emissions will be further reduced by eliminating up to 18 deliveries of brine from Burnaby to National Yards during the winter season. This equates to eliminating roughly 300 km of travel by a delivery truck in a year.

Brine and salt has proven to be an effective de-icing material for the ice and snow conditions experienced in Vancouver. The City conducts an annual environmental monitoring program ("Sodium Chloride Monitoring Program") at six locations of five separate fresh water ponds and creeks within the City.

In 2005, the City had an independent environmental assessment of its road salting operations completed by Gordon Berezay, MSC RP Bio, of Stantec Consulting Limited. The report, entitled "Biological Evaluation of the City of Vancouver Road Salting Operations on Receiving Waters" noted that, based on the test results from our the City's Sodium Chloride Monitoring Program (initiated by the City in 2002), "There is no indication that chloride levels from Road Salt Operations will exceed the guidelines for British Columbia or the United States and do not persist in any of the receiving waters."

Multi-Utility Vehicles (MUVs)

MUVs are currently only available in a biodiesel model. The current leased MUVs have been right sized and have an engine size of 3.62 L while previous rental units had an engine size of 4.4 L. It is estimated that approximately 2.17 tonnes of GHGs will be generated annually as a result of these additions.

The use of the MUVs will eliminate the need for an existing loader (C2166) and an existing sweeper (B2120) that produces roughly 3.2 tonnes of GHG. The net decrease of GHG production by replacing the existing equipment with two (2) MUVs is 1.05 tonnes, assuming usage similar to the vehicles being replaced.

Skidsteer Construction Loader

The skidsteer will be powered by a bio-diesel engine and will contribute 7.3 tonnes of GHG annually. There are no other engine or alternate fuel options available.

Environmental – Vehicles

The Corporate Vehicle & Equipment Selection Tool (CVEST) which incorporates the Corporate Strategic Fleet Plan goals of reducing emissions, leading the way on sustainable fleet practices, providing best value, and supporting operations was used to review the vehicular options available. The options that were considered for these vehicles included liquefied natural gas (LNG), compressed natural gas (CNG), electric, gasoline, and diesel. The CVEST output supports the vehicle recommendations in this report.

Of these options, the LNG and CNG options are currently planned to be used only in limited quantities to assess concerns about operational effectiveness, maintenance costs, and reliability factors. A natural gas pilot is being developed to assess its viability and these vehicles will be considered for that pilot.

Hybrid and electric vehicles are now available for certain vehicle types and produce reduced tailpipe emissions. The asset cost of hybrid and electric vehicles is higher than fossil fuel models, therefore prior to purchase Equipment Services assesses if the additional asset cost can be offset by reduced on-going costs such as fuel and maintenance. Generally the offsets are only large enough on high mileage units. These vehicles and equipment are not considered high mileage, and therefore do not represent a strong business case for hybrid and electric vehicles.

Gasoline and biodiesel powered vehicles meeting the latest regulatory emission requirements are the recommended options for these additions, as they are proven technologies that are commercially available. They meet operational needs and provide the best value for the application(s).

1 Yard Dump Trucks

The 1 yard dump trucks will be powered with biodiesel and will contribute 61.2 tonnes of GHG annually.

Light Pickup Trucks

There are two (2) pick up trucks with gasoline engines and will contribute 11.3 tonnes of GHG annually.

Cube Van

The cube van will be powered by a gasoline engine. The cube van with a power tailgate will produce roughly 8.5 tonnes of GHGs per year.

Heavy Panel Van

The heavy panel van will be powered with a biodiesel engine. This will be right-sized from the current 4.6L V8 gasoline engine to a 3.0 L V6 biodiesel engine. The heavy panel van will produce roughly 9.3 tonnes of GHGs per year which is 1.8 tonnes less than the larger engine option.

CONCLUSION

There is an ongoing need for 18 units of various types in the Streets Traffic and Electrical Operations fleet. It is more economical to purchase City-owned units than it is to continue to lease as there is an estimated savings of $276,400 that can be realized annually. Therefore, it is recommended that Council authorize the addition of 18 units to the Streets Operations fleet. The addition of these units requires a funding allocation of $1,177,500 from the Truck and Equipment Plant Account. The existing Streets Traffic and Electrical Operations Budget will provide the $397,300 required to cover the total annual asset repayment and ongoing asset expenses of the new units in 2012. For future years the $397,300 in overall asset costs will be managed in the context of the annual budget process.

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APPENDIX A: VEHICLE JUSTIFICATION AND USEAGE

1. SIDEWALK MAINTENANCE	
	The sidewalk maintenance group increased by one crew in 2008 in order to keep up with the repair requests associated with sidewalk tripping hazards and requires the use of a one yard dump truck and a cube van. These crews perform sidewalk repairs using a method to 'grind' the sidewalk flat instead of filling uneven sections with asphalt. This repair method has substantially reduced the amount of time spent to level sidewalks. Moreover, it prolongs the life of the repair by five (5) times, reduces complaints from the public since it is more aesthetic, and reduces risk and increases the safety of the public. Funding for sidewalk grinding is through a re-allocation of funds within the existing Streets Operations Maintenance Budget. If this equipment is not approved then Streets will either continue to lease at a higher cost or disband the crew resulting in an increase in complaints and tripping risk to the public.
- One (1) One yard dump truck	The one yard dump truck is required to transport crews and up to one cubic yard of bulk materials such as concrete patching mixes, sand, gravel, and asphalt and has been right sized for their payload requirements. This unit is desirable for accessing tight laneways since it is smaller than a tandem axle, or three yard dump truck. The available payload capacity is sufficient and allows Streets Operations to transport material to support smaller job sites. Also, one yard dump trucks are the smallest trucks with a configuration suitable to be equipped with salters and plow; therefore, they can also be used as specialized vehicles during snow and winter season to access narrow streets and lanes.
- One (1) Cube van with power tailgate	The cube van is required to transport and store heavy and expensive concrete grinders. The unit is also used to transport staff to worksites. Outfitting requirements include lockable storage for expensive tools and their replacement parts, a hydraulic lift for easy loading and unloading of stored equipment that can weigh up to 100 kg, and custom shelving to store small replacement parts, hoses, signs, safety equipment, rain gear, and other tools. The cube van is the only vehicle of its kind in the STEO fleet and is right sized to meet the outfitting and operational requirements.
2. MAINTENANCE CONCRETE CUT REPAIR (MCCR)	
	The MCCR group has expanded by one crew from four (4) crews to five (5) to respond to an increase in cut-repair volume and therefore requires the continued use of one (1) one yard dump and one (1) pick up truck. These crews replace sidewalk, curbs, and concrete road sections which get damaged when new underground services are put into homes, or during smaller utility installations. The program is funded by flat rates charges through the Cut Repair System.
- One (1) Light pick up truck	A pick-up truck with an 8' box is required by a sub-foreman, who is regularly picking up and dropping off materials, signs, etc. not only to the active working site, but also to upcoming sites as well.
- One (1) One yard dump truck	A one yard dump truck is required to transport crews and up to one cubic yard of bulk materials such as concrete, concrete patching mixes, sand, gravel, and asphalt and has been right sized for the payload requirements. This type of unit is desirable for accessing narrow streets and tight laneways since it is smaller than a tandem axle, or three yard dump truck. The available payload capacity is

sufficient and allows Streets Operations to transport material to support smaller job sites. Also, one yard dump trucks are the smallest trucks with a configuration suitable to be equipped with salters and plows; therefore, they can also be used as specialized vehicles during snow and winter season to access narrow streets and lanes.

3. ASPHALT MAINTENANCE CREW

The maintenance crews provide on-going maintenance for over 1,400 kilometers of asphalt roadway. Pot-hole repairs are an important component of the work the asphalt maintenance crews performs as these repairs ensure that the integrity of the roadways, bike lanes, and greenways are maintained, and prevents damage to vehicles traveling on uneven road surfaces. Streets Operations has identified areas where operational efficiencies can be achieved with the use of more versatile equipment to help with pot hole repair work. Streets repaired approximately 39,500 potholes in 2011.

The ongoing costs for the asphalt heater and truck used by the dedicated pot hole repair crew are billed out to a specific project as part of the pothole repair activity charge.

If these units are not approved Streets will continue to lease at a higher cost or abandon this new more efficient practice; resulting in an increase in time to fill pot holes, lower quality patches that require more frequent repairs, faster deterioration of the street structure and higher risk to motorists and cyclists as more potholes will be present.

- One (1) asphalt heater

In February 2009, Streets Operations leased one (1) asphalt heater as a trial to determine if operational efficiencies could be achieved with this unit. The trial unit was assigned to a dedicated pot hole repair crew. An asphalt heater is an insulated box that maintains asphalt at a workable temperature. Without the use of a constant heat source, asphalt loaded onto a truck at the beginning of the day would gradually harden throughout the day, requiring a crew to return to the asphalt yard, dump the old asphalt for recycling and load a new batch of asphalt again. Loading and dumping of asphalt may occur up to two (2) times a day, depending on the weather. The cost of wasted asphalt is estimated to be $5,000 annually.

Savings and operational efficiencies have been achieved with the use of the leased asphalt heater and it is recommended that the unit be added to the fleet. Without the ability to keep asphalt warm throughout the day, it is estimated that roughly 0.25 tonnes of hardened asphalt is brought back to the recycling yard by the pot hole repair crew on a daily basis. With asphalt costing $75 per tonne, roughly $5,000 worth of virgin asphalt is being used for its intended purpose instead of being sent for recycling. In addition, unnecessary trips to the recycling and supply yard to dump wasted asphalt are being eliminated.

The asphalt heater was previously leased and now has been paid off and therefore, no outstanding asset costs remain on the unit.

- One (1) One yard dump truck

A one yard dump truck is required to tow the asphalt heater as well as to transport the pot hole repair crew and equipment such as shovels to job sites.

4. SNOW REMOVAL

In the event of a snow fall, Street Operations provides snow removal services that are necessary to ensure public safety, as well as to manage risks involving City assets and the public.

The City's snow fighting equipment consists primarily of salters and plows mounted on City dump trucks. The plows are mounted on the front of the dump trucks and clears snow by pushing it to the side of the road. A salter is mounted in the dump body of the dump truck, and spreads salt on the road to melt snow and ice for the purposes of improving vehicle traction.

In most cases, snow and ice alerts in Vancouver do not extend over a long period of time and are manageable with the salters and plows. However, in the event of extreme and prolonged winter conditions, additional specialized snow removal equipment is required. The City experienced harsh winter conditions in the winter of 2008 and as a result, large piles of snow cleared to the side of the street had to be moved by earth moving equipment and relocated. Relocation was required because the volume of plowed snow was gradually encroaching on road space and pedestrian walkways, making it difficult for the public to get in and out of parking spaces and into businesses.

As a result of the winter conditions in 2008, STEO has identified the need for specialized equipment including a snow blower, a brine mixer and two (2) MUVs to aid in snow removal and anti-icing operations on bikeways, pedestrian walkways and roadways.

Funding for all snow clearing and de-icing activities is through the STEO snow fight account.

- **Two (2) Multi-Utility Vehicles**

  In late 2009, STEO leased, on a trial basis, a Multi-Utility Vehicle (MUV) to assist with snow removal leading up to the Olympics. An MUV is a relatively narrow tractor that has the ability to couple to various attachments and implements. The versatility of the MUV to be used to plow snow, or as a streets sweeper, allows the unit to be used year round and for different operations; they can be used on sidewalks, pathways, but the primary use will be to clear the City's new Separated Bikeways quickly and efficiently.

  MUVs are required as there are no on-road machines in the fleet that can service bike lanes, during snow and ice alerts. The compact size of the MUVs allows for the proper snow removal and de-icing of not just the bike lanes, but of other restricted laneways such as the sea wall and various bridge walkways.

  Two (2) MUVs are required to ensure that the City's 28 designated bike routes and restricted laneways are serviced in a timely manner. If these units are not approved Streets will continue to lease at a higher cost or discontinue the use of this equipment; resulting in an accumulation of snow and debris on bike routes and pedestrian pathways making these areas less accessible or requiring expensive and slow manual labour.

- **One (1) Snow blower**

  Snow removal is most effective with the use of snow blowing equipment. In December 2009 STEO purchased a used high volume snow blower in preparation for possible extreme weather conditions during the Olympics. The snow blower is a heavy duty vehicle with a blower at the front that can move large volumes of snow directly into the box of a dump truck. It is used to remove snow at an estimated rate of 3,000 tonnes of per hour.

The unit is only essential in inclement weather involving heavy snowfalls and is used to clear large arterial streets. The usage on the unit is expected to be minimal and thus, it will not be replaced at the end of its useful life. Leasing large snow blowers is difficult, as they are large specialty pieces of equipment and thus, not always available. With the asset cost paid off and the low usage expected there is minimal annual ongoing asset cost required to keep this unit in the fleet, thus providing an inexpensive means for responding quickly and efficiently to major snow fall events.
If this unit is not approved STEO will be required to use loaders to remove snow in the event of a major or prolonged snow event. This removal will be slow and inefficient, leading to higher risk for drivers and pedestrians.

- One (1) Brine mixer

Streets Operations is moving towards a more proactive anti-icing and de-icing program with the use of brine. Brine is a solution of salt and water that effectively lowers the temperature at which freezing occurs from 0°C to approximately -19°C. Thus, the application of brine before a snow fall or before the onset of freezing temperature significantly reduces the need for snow removal and the formation of ice on roads. Brine also reduces the amount of salt required to clear roads and as a result, streets are safer for the public with less impact on the environment. Primary areas of application of brine are on the City's 28 bike routes, high-priority hills, pedestrian walkways and sidewalks. It is also used to help road salt adhere to major arterial roads.

Until recently, brine was purchased from a supplier and delivered to National Yards at a cost of $0.21 per liter. Due to limited delivery and supply issues, STEO began leasing a brine mixer at the start of 2011 and is able to produce brine at an estimated cost of $0.06 per liter. It is estimated that the volume of brine used each season will increase from approximately 48,500 L to 145,000 L going forward. Therefore, based on expected volumes, Streets Operations will save approximately $22,000 annually by producing brine as opposed to purchasing the solution. Furthermore, City production of brine would eliminate the need for deliveries, which will reduce greenhouse gas (GHG) emissions. It will also ensure that sufficient supply and access is available during emergency snow fights, especially over the weekend when deliveries may be difficult to secure.

- One (1) One yard dump truck

The one yard dump truck is required to transport the brine tank to de-ice bike lanes and other restricted laneways such as the sea wall and various bridge walkways. One yard dump trucks are desirable since they are smaller than tandem axle, or three yard dump trucks. During the rest of the year, the truck will be utilized by seasonal crews to transport crew and to haul material to and from job sites.

This service level increase will make walking and cycling safer and encourage and support those modes of transportation, as per the City's Greenest City Action Team (GCAT) objectives.

5. TRANSIENT-RESPONSE PROGRAM

The transient-response program has been evolving over many years, but has had a dedicated budget since 2007. It was formalized into two (2) distinct crews in an effort to better assist the Vancouver Police Department (VPD), and provide the ability to quickly clean up the sites that were formerly occupied by those who are homeless.

	Funding for this program is available through the STEO Budget.
- One (1) one yard dump truck	One (1) one yard dump truck is required to move items located at sites previously habituated by the homeless and may include shopping carts, mattresses, sofas as well as other large household items.
One (1) light pick up truck	One pick up is required for the foreman of the crews. The foreman liaises with the VPD and 311 to dismantle formerly occupied sites such as tent cities.
7. UTILITY LOCATOR	
- Two (2) heavy panel vans	Utility locator crews are critical to any major streets construction job and work would not be able to proceed without pre-locating utilities. There is no option to not have these crews in service Two (2) vans are required to transport the two (2) Utility Locator crews, their locating-equipment, plus various tools such as measuring wheels, paint, and shovels. A van provides sufficient cargo room and payload to store and secure this equipment. . Funding for this service is charged directly to Capital Projects, Maintenance Programs, or through Cut-Repairs.
8. GENERAL OPERATIONS	
	To support general operations and to offset on-going costs to the City from contracted work a second skid-steer loader and truck were leased. Ongoing asset costs for the truck and skid-steer are billed out to capital or operating projects on which they are used.
- One (1) skidsteer construction loader	The skid steer loader is required to move loose material/tools and equipment on various projects, such as sweeping support to asphalt grinding operations, small patch asphalt grinding and snow removal.
- One (1) yard dump truck	A one yard dump is required to tow a trailer carrying an existing skid steer loader to and from job sites. The one yard dump truck also carries many of the skid steer loader attachments in the bed of the truck.
9. CIVIL ELECTRICAL CREW	
- One (1) one yard dump truck	This vehicle is required to support the civil electrical operations crews which expanded in 2008 from four (4) crews to five (5) crews. Civil electrical crews install pipe runs under the sidewalks/streets and install the bases for lamp standards. One (1) one yard dump truck is required to haul personnel, concrete, road mulch, and electrical pipe to and from work sites.

Appendix B: GHG Emissions

Table 4: GHG Emissions and overall fleet GHG reduction

# of Units	Proposed City-Owned Vehicle & Equipment	Fuel Type	GHG current emission	GHG due to proposed changes	GHG Reduction
1	Snow Blower	Bio-Diesel	1 tonne / snowfall event	1 tonne / snowfall event	0
1	Asphalt Heater	Propane	5.8 tonnes /annum	3.7 tonnes / annum	2.1 tonnes /annum
1	Brine Maker	Electric	0	0	0
2	MUV	Bio-Diesel	3.22 tonnes / annum	2.17 tonnes / annum	1.05 tonnes / annum
7	1 Yard Dump	Bio-Diesel	61.2 tonnes / annum	61.2 tonnes / annum	0
2	Light Pickup Truck	Gasoline	11.3 tonnes / annum	11.3 tonnes / annum	0
1	Cube Van, Power Tailgate	Gasoline	8.5 tonnes / annum	8.5 tonnes / annum	0
2	Heavy Panel Van	Bio-Diesel	10.1 tonnes / annum	9.3 tonnes /annum	1.8 tonnes / annum
1	Skidsteer, Loader	Bio-Diesel	7.3 tonnes / annum	7.3 tonnes / annum	0
Totals					4.95 tonnes / year