CITY OF **VANCOUVER**

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ADMINISTRATIVE REPORT

Report Date:	October 24, 2007
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Meeting Date:	November 13, 2007

TO: Vancouver City Council

FROM: General Manager of Engineering Services

SUBJECT: Fleet Addition – Asphalt Grinder and Trailer

RECOMMENDATION

A. *THAT Council approve the allocation of $490,000 from the Truck and Equipment Plant Account to add one one-metre milling width asphalt grinder and one flat-deck trailer to the fleet.*

B. *THAT the capital and operating costs be repaid to the Truck and Plant account through annual charges of $145,000, funding to be provided from existing Streets Operations Operating Budget.*

COUNCIL POLICY

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.

PURPOSE

The purpose of this report is to seek Council approval to add one one-metre milling width asphalt grinder (asphalt grinder) and one flat-deck trailer to the Engineering fleet for use by the Streets Operations Branch.

BACKGROUND

The Streets Operations Branch (Streets Operations) is responsible for maintaining and constructing the City's streets, lanes and sidewalks. The construction crews oversee all construction, reconstruction and paving of roads, curbs, sidewalks, and greenways in the City. The maintenance crews provide on-going maintenance for over 2,000 kilometres of asphalt roadway in the City, and also respond to citizen concerns about potholes, boulevard problems, out-of-elevation sidewalks and lanes, grass cutting, flooding, and snow and ice control. The maintenance crew has also been involved in a number of projects related to re-building sidewalks, roadways, and lanes in residential neighbourhoods.

DISCUSSION

The construction, maintenance and re-building of City streets often necessitate that the existing asphalt be removed in order to properly repair the roadway. Main arterial roads which experience heavy traffic volumes and high loads from large trucks generally suffer from surface deterioration. Repairs to main arterial roads involve the removal of 2-3 inches of asphalt (a process known as slot-grinding) which is then re-paved and rolled to grade. On thinner pavements, such as residential streets, repairs often involve removing asphalt and replacing weak sub-grade material prior to repaving (a process known as cut-out and patch). Asphalt is also removed to allow other utilities, such as Sewers and Waterworks, to do work below.

The asphalt can be removed using jackhammers, backhoes or saws for smaller applications; backhoes and excavators are used on larger operations. However, this equipment is not able to accurately remove asphalt on shallower jobs, such as the removal of only the top 2" on a 6" thick pavement for subsequent asphalt overlay purposes. The most efficient method of removing asphalt requires the use of an asphalt grinder.

An asphalt grinder is a machine that removes existing pavement layers to a desired depth using a rotating grinding drum. The grinding drum breaks up the asphalt, and once the asphalt has been broken up, the grinder collects the ground asphalt, and loads the debris into a waiting dump truck travelling ahead of the grinder, which then hauls the asphalt off-site. The machine has a high level of control and allows the pavement surface to be removed to a specified depth, grade and cross-slope. For this reason, the asphalt grinder can be used for slot-grinding on main arterial roadways as well as cut-out and patch operations on residential streets.

The asphalt grinder has the advantage of providing increased control and productivity in asphalt removal operations, when compared to other equipment such as backhoes and excavators which can only remove the full depth of pavement rather than just the required 2-3" of asphalt needing resurfacing. The high degree of control with an asphalt grinder provides a cleaner excavation and improves the quality and lifespan of the pavement. The grinder also minimizes damage to the surrounding pavement. In addition, asphalt grinders are estimated to remove asphalt at approximately twice the rate of a backhoe or excavator.

An additional benefit of the asphalt grinding machine is its ability to work and travel in the same direction as traffic and only occupy the lane that is being repaired, which minimizes traffic disruptions and increases worksite safety. Removing asphalt with backhoes and

excavators require two lanes to be blocked off as the dump trucks must travel beside the equipment. With these other options, the operator must also turn sideways to the direction of travel to load the asphalt to the side and in some cases, the operator must travel against the direction of traffic. With an asphalt grinder, the dump truck travels in front of the asphalt grinder and is loaded from the front of the machine, which improves the operator's visibility and reduces potential for an accident.

Asphalt grinders also increase flexibility and reduce traffic interruptions because vehicles can travel on the roadway immediately after grinding is complete and before the new pavement is laid. Other methods of asphalt removal leave the road surface jagged and uneven and the road cuts are too deep and hazardous for vehicle travel.

A flat-deck trailer is required to transport the asphalt grinder to each construction site because asphalt grinders are not permitted to be driven with traffic. Streets Operations does not currently have a trailer that has the capacity to carry the asphalt grinder and a new trailer must be added to the fleet for this purpose. The trailer will be towed using an existing tandem dump truck.

FINANCIAL IMPLICATIONS

Currently, Streets Operations contracts a third-party company on an hourly basis for its asphalt grinding needs. The asphalt grinder for slot-grinding or cut-out and patch operations is contracted for approximately 1,150 hours annually, at a rental rate of approximately $500/hour. Consequently Streets Operations spends approximately $575,000 annually from its budget to cover the cost of a rental unit which includes external rental rate for the unit, one operator, maintenance, insurance, fuel, and transportation of the rental unit to the construction site. This level of work is projected not only to continue, but based on the street replacement and repair needs, to be expanded over the coming years.

The annual estimated cost to operate a City-owned asphalt grinder would be $133,000. The operating costs for the City-owned grinder include the internal rental rate for capital, maintenance, insurance, and fuel charges. A trailer to tow the asphalt grinder would cost an estimated $12,000 annually to cover charges for capital rental rates, maintenance, and insurance. The charge for a City operator to operate the asphalt grinder for 1,150 hours is estimated to be $41,500. Therefore, the total cost to own and operate an asphalt grinder and trailer would be $186,500 per year. There is the potential to save approximately $388,500 annually by switching from a rental unit to a City-owned unit.

The realized savings will be distributed among the different services that Streets Operations provides. Approximately $77,700 of the savings will be designated for Capital Projects and will allow the Streets Design Branch to schedule additional paving work that would otherwise not be considered. An estimated $155,400 will be used to reduce the charge-out rate to clients for road repairs or to off-set other rising costs, such as material and labour. The remaining $155,400 of the savings will be allotted to the Operating Budget which will permit Streets Operations to repair more streets and improve the maintenance of City streets.

The purchase of a 1-metre milling width asphalt grinder and trailer will require a one time charge of $420,000 for the asphalt grinder and $70,000 for the flat-deck trailer. Funds for the purchase will be provided from the Truck and Equipment Plant Account, which will be repaid over the ten year life of both the asphalt grinder and trailer through the internal rental rates.

ENVIRONMENTAL IMPLICATIONS

The asphalt grinder will be powered by a diesel engine and staff will ensure that the grinder is able to operate on bio-diesel. The new unit fuelled by bio-diesel will have less harmful emissions than the unit currently being rented. Furthermore, the asphalt grinder engine shall meet the latest Tier III emissions regulations, as set out by the U.S. Environmental Protection Agency.

The asphalt removed by the asphalt grinder will be recycled at the City's Kent Construction Supplies and Services plant and re-used by Streets Operations for new asphalt or fill material.

CONCLUSION

It is recommended that Council authorize the addition of one one-metre milling width asphalt grinder and one flat-deck trailer to the Streets Operations fleet, at a total cost of $490,000 to be allocated from the Truck and Equipment Plant Account. Savings of approximately $388,500 can be achieved annually with the purchase of a City-owed asphalt grinder over a hired contractor. The savings will be used to repair and improve City streets.

The annual internal rental rates of approximately $133,000 for the asphalt grinder and $12,000 for the trailer will be provided by the existing Streets Operations Operating Budget.

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