CITY OF HAMILTON

HAMILTON EMERGENCY SERVICES
Fire Division

TO: Chair and Members
Emergency & Community Services Committee
WARD(S) AFFECTED: CITY WIDE

COMMITTEE DATE: October 6, 2010

SUBJECT/REPORT NO:
Corporate Trunked Radio System Upgrade (HES10011) (City Wide)

SUBMITTED BY:
Jim Kay
General Manager / Chief
Hamilton Emergency Services

PREPARED BY:
Phil Thorburn (905) 546-2424 ext. 7120

SIGNATURE:

RECOMMENDATION

(a) That additional funding for the Corporate Trunked Radio Upgrade Project, to allow for the development of required radio sites and additional end user equipment for Police and Fire, in the amount of $1.4 million, to be funded through the existing, approved debt repayment, be approved.

(b) That, upon approval of the $1.4 million dollars for the development of required radio sites and end user equipment for Police and Fire for the Corporate Trunked Radio Upgrade Project, staff be authorized and directed to add this site development work to the scope of the existing contract with Motorola Canada as part of the upgrade project.

EXECUTIVE SUMMARY

Staff is currently working with Motorola Canada to complete the upgrade of the City of Hamilton’s (City) critical public safety communications infrastructure as approved by
Council on April 29, 2009 (Report HES08004(a) as it relates to the Corporate Trunked Radio System. In Report HES08004(a), a proposed budget of $21.6 million was brought forward to complete the required work to upgrade the existing Corporate Trunked Radio Infrastructure and associated end-user equipment. The goal of the upgrade project was to try to work within the established funding envelope that already existed within the Corporate Trunked Radio Operating Budget. The previous system was leased and as the lease payments dropped off in value, the available funding from those lease payments is being used to carry the debt financing for the upgrade project.

The target date for migration of all users to the upgraded infrastructure is end of 2nd quarter 2011. The overall project completion date is 2nd quarter of 2012 which includes clean-up of legacy equipment and decommissioning of abandoned sites.

After the negotiation of the contract with Motorola was completed, three (3) core principals were used during the detailed design review to make decisions moving forward as it related to the architecture of the upgraded infrastructure:

1) provide coverage and services throughout the 1,200 square kilometres of the City that meet the core needs of Police and Fire;
2) wherever possible look at leveraging technology to help control operating costs of the upgraded infrastructure; and
3) provide a level of redundancy acceptable for Police and Fire users to ensure wherever possible any risk of a communication outage is eliminated.

In 2010, two-way voice communications remain core to the delivery of emergency services throughout the city. Police and Fire users require reliable portable radio coverage throughout the entire city regardless of whether they are standing on the street or inside a building. In order for this to be achieved, the original plan of trying to re-use all the existing sites had to be abandoned. Engineered coverage maps of the current sites revealed areas within the city that needed to be addressed. As a result new coverage maps where developed to access the impact of moving various sites to ensure that optimal coverage was obtained. Wherever possible, existing City properties where used thereby minimizing operational costs by avoiding the leasing of property and sharing of back-up generator power, if it was already existing at a site.

The upgraded infrastructure now includes ten radio transmitter sub-sites, two (2) dispatch centres and one (1) master / prime site. The current system utilizes five (5) radio transmitter sites, (4) radio receiver sites, one (1) master site and two (2) dispatch centres. At the start of the upgrade project it was hoped that all existing sites could be re-used, after the completion of the detailed design review it became clear that we would only be able to re-use three (3) of the nine (9) existing radio sites. This is due to various factors such as physical space limitation preventing the installation of new equipment, lack of power capacity and/or backup generator, HVAC, unexpected construction/maintenance at existing sites and radio coverage issues identified during
the detailed design review. Due to the fact that only three (3) sites are re-used the site development costs are higher than originally anticipated for the project.

To date, factory acceptance testing has been completed and all infrastructure hardware has been received. It remains staged and ready for installation as soon as all necessary site preparation/upgrade work has been completed. Due to space constraints at existing sites, the bulk of the infrastructure install will not occur until the majority of the site work is complete across the city. This is due to the fact that some of the channels must be decommissioned on the current system to allow for enough space to install the new infrastructure along side of the old system. Decommissioning of channels will reduce the current system’s overall capacity and level of fault tolerance; as such this action must be properly aligned with the completion of new sites to minimize any operational impacts during the upgrade process.

Given the need for tight coordination with the rest of the project activity and the lack of available staff resources to oversee the site development, staff is recommending that the site development work be completed as an expansion of the existing contract to upgrade the Corporate Trunk Radio Infrastructure. Motorola would manage the site development work and contract a third-party as a subcontractor to complete the necessary work using a design/build model. This is typical approach used in the telecommunications industry for this type of construction. Site development work consists of engineering review of requirements, site preparation (i.e. foundations, fencing, grading), installation of electrical service, backup diesel generator and grounding, installation of pre-fabricated tower and installation of pre-fabricated equipment shelter.

The upgrade project is being funded from the Capital Budget Account #7800951900. The funding source is a combination of established Corporate Radio Reserves, Hamilton Police Services - Approved Capital Project for Communications Equipment and financing. The project timelines and payment schedule have been worked out to allow for the costs of the debt charges to be funded from within the Corporate Radio Operating Budget. This will be accomplished by capturing the surplus funding as a result of declining lease payments on the current system and redirecting it to offset debt charges from the financing required to facilitate the upgrade of the trunked radio infrastructure. The net result being a zero (0) levy impact for 2011.

In 2012, there will be an increased pressure on the Operating Budget to cover off the annual maintenance agreement costs of approximately $450K per year which are paid out monthly. Annual maintenance charges are due one (1) year after system acceptance.

Alternatives for Consideration – see page 7.
Financial:

As a result of needing to move some sites to new locations and the expanded need for additional end-user equipment in Police and Fire, additional unforeseen budget pressures now exist which requires additional funding of $1.4 million to allow for completion of the project. This equates to an approximate increase of 6% over the original budget forecast. The additional funds, if approved, would be added to the current financing already in place for the project.

The revised total cost of the upgrade project as a result of additional funds required for site work and additional end-user equipment is $23 million. The project has been partially funded from existing Hamilton Police Services Capital Project ($3.2M) and the Corporate Radio Reserve ($5.4M). The balance of the funding ($14.4M) will be financed over 15 years and repaid through debt charges.

The table below outlines the changes in the operating costs over the next five (5) years. Given that the current infrastructure is leased, the finance costs will be covered off from the current Corporate Radio Operating Budget which will result in zero (0) impact on the levy in 2011.

<table>
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<tr>
<th>TRUNK RADIO OPERATING COSTS</th>
<th>PREVIOUSLY APPROVED</th>
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<tr>
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<td>2010</td>
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<td>EMPLOYEE RELATED COST</td>
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<td>BUILDING AND GROUND</td>
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<td>LICENSE FEES</td>
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<td>LEASE RENTAL RECOVERY</td>
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<td>GROSS OPERATING COSTS</td>
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DOLLAR CHANGE INCR / (DECR)          | 19,388 | 120,865 | 64,002 | 63,658 | 54,070 |
% CHANGE INCR / (DECR)                | 0.9%   | 5.6%   | 2.8%   | 2.7%   | 2.2%   |
### PROPOSED

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<tr>
<th></th>
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<th>2012</th>
<th>2013</th>
<th>2014</th>
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<td>(51,692)</td>
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<td><strong>2,410,911</strong></td>
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| DOLLAR CHANGE INCR / (DECR) | 7,894  | 8,965  | 215,634 | 27,378  | 18,356  |
| % CHANGE INCR / (DECR)      | 0.4%   | 0.4%   | 9.9%    | 1.1%    | 0.8%    |

### Staffing:

None.

### Legal:

None.

### HISTORICAL BACKGROUND (Chronology of events)

In October 2008, Report HES08004 relating to Corporate Trunked Radio Upgrade provided a budget estimate of $21.6 million to complete the upgrade of the existing Corporate Trunked Radio System and requested authorization to negotiate directly with Motorola. In March 2009, a finalized contract was negotiated with Motorola for the $20.6 million to cover off the upgrade of the infrastructure and end-user equipment. This left $1 million for contingency funds to allow for upgrades/repairs to the physical plant (i.e. building, roofing, HVAC, generator, electrical upgrades, etc.) at the existing sites.
After completing the detailed design review and system acceptance it became clear that the original plan of only upgrading existing sites was not in the best interest of the City as this would not allow for the ability to optimize coverage throughout the city especially in areas of growth since 1995. Therefore, it was determined some jurisdictions required new sites to be built. In addition some current sites lack proper environmental controls to ensure longevity of the new infrastructure equipment.

Additionally, there has been an increase in the number of portable radios for Police in order to meet street strength and new program requirements. For Fire, additional radios are required in the Volunteer Suppression Division to address previously identified health & safety concerns as it relates to all firefighters on the fireground having a portable radio issued to them. This allows them to alert others that they require assistance via the emergency button on the radio so that should they get into trouble during an incident. Additionally, personal issue of radios to the volunteer firefighters would allow for Fire Communications to more quickly access the response of manpower from a given station at the time of dispatch during an alarm thereby minimize any delays in response should an additional station be required to manage the alarm.

As a result of the above noted factors, additional funding will be required to complete the upgrade project.

**POLICY IMPLICATIONS**

None.

**RELEVANT CONSULTATION**

Corporate Services, Budgets & Finance Division provided the budget analysis for the additional $1.4 million as detailed in the Financial Implications.

Hamilton Police Services advised that they require more end user equipment to meet current operational needs.

**ANALYSIS / RATIONALE FOR RECOMMENDATION**

The recommendations deals with the request for approval of additional funds so as to allow for improved reliability and optimal coverage using ten radio transmitter sites spaced evenly throughout the city. This would be accomplished by rationalizing site
locations to ensure all sites have access to backup generator power and are best positioned to deal with areas of growth that have occurred since 1995.

Additionally access to adequate quantities of end-user equipment is critical in managing health and safety concerns for Police and Fire users thereby ensuring that they can always reach their respective dispatch centres should the need arise.

**ALTERNATIVES FOR CONSIDERATION**

*(include Financial, Staffing, Legal and Policy Implications and pros and cons for each alternative)*

While existing sites could be used, this approach is not recommended by staff. Given the complexity of the infrastructure it is not financially or operationally possible to correct coverage issues after the system goes live without incurring additional costs to add more sites to fill-in any coverage holes already identified by the engineering models and as noted from the users of the current system. The reuse of existing sites also adds greater risk of disruption of the current Trunked Radio System due to the space and power limitations that exist at some sites.

**CORPORATE STRATEGIC PLAN** *(Linkage to Desired End Results)*


**Skilled, Innovative & Respectful Organization**

- More innovation, greater teamwork, better client focus
- An enabling work environment - respectful culture, well-being and safety, effective communication

**Financial Sustainability**

- Financially Sustainable City by 2020
- Effective and sustainable Growth Management
- Delivery of municipal services and management capital assets/liabilities in a sustainable, innovative and cost effective manner
- Full life-cycle costing for capital
- Address infrastructure deficiencies and unfunded liabilities

*Vision: To be the best place in Canada to raise a child, promote innovation, engage citizens and provide diverse economic opportunities.*

*Values: Honesty, Accountability, Innovation, Leadership, Respect, Excellence, Teamwork*
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Growing Our Economy
- An improved customer service

Social Development
- Everyone has a home they can afford that is well maintained and safe
- Residents in need have access to adequate support services

Environmental Stewardship
- Natural resources are protected and enhanced
- Reduced impact of City activities on the environment
- Reduce the impact of Hamilton's industrial, commercial Private and Public operations on the environment

Healthy Community
- Plan and manage the built environment

APPENDICES / SCHEDULES