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CITY OF **VANCOUVER**

ADMINISTRATIVE REPORT

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TO: Vancouver City Council

FROM: R. Holdgate, General Manager, Fire & Rescue Services

SUBJECT: Changes to E-Comm's Computer Aided Dispatch(CAD) System used by Vancouver Fire & Rescue Services (VFRS)

RECOMMENDATION

A. *THAT Council approve the participation of Fire and Rescue services in the process to replace the existing Altaris CAD system with an Intergraph CAD system, that system to be purchased, housed and managed at E-Comm and made available to all participating E-Comm Class A shareholders, with the following financial implications:*

- *an increase in the CAD Levy from E-Comm of $303,900 for access to the new CAD system;*
- *an increase in the CAD Levy from E-Comm of $147,500 to allow replacement of out-dated Mobile Data Terminals (MDT) in fire apparatus with Mobile Work Stations (MWS) that are fully integrated with the Intergraph CAD software; and*
- *an increase in the Fire and Rescue Services annual budget of $44,700 for wireless data fees and support of the Mobile Work Stations;*

these annual costs to be added to the Operating Budget beginning in 2007 (prorated for 2007) without offset.

B. *THAT Council approve an increase to the Radio Levy from E-Comm of $69,900 (2007 pro-rated) for the replacement of the Fire Hall Alerting (FHA) system in Vancouver firehalls, to be fully integrated with the new Intergraph CAD software; costs to be added to the Operating Budget in 2007 (prorated for 2007) without offset.*

C. *THAT Council approve the addition of one-time implementation costs of $101,200 related to the Intergraph CAD / Fire Hall Alerting implementation project for the purchase of SQL server client-access licenses and the training of fire suppression staff; source of funds to be the Reserve for E-Comm implementation costs.*

GENERAL MANAGER'S COMMENTS

In 2004, City Council approved the transition of the Vancouver Police Department from Altaris CAD to a new CAD system to take advantage of integrated technology for dispatch and records management and multi-jurisdictional functionality. The migration of Police dispatching from Altaris CAD left Vancouver Fire and Rescue as the major remaining user on the old CAD system which was designed as a tri-service (Police, Fire and Ambulance) system. There are a number of compelling technical reasons discussed in this report that support the development of a new fire service specific CAD solution which will support service efficiency, safety and user satisfaction. There is also an economic justification in that the development of a new system will result in savings over attempting to modify and upgrade the existing system.

The General Manager/Fire Chief of Fire and Rescue Services RECOMMENDS approval of the foregoing.

CITY MANAGER'S COMMENTS

The City Manager RECOMMENDS approval of A, B and C.

COUNCIL POLICY

Council has identified goals for public safety and emergency preparedness, and has approved recommendations providing funding for the City's Emergency Operations Centre (EOC), the regional 800 MHz trunked radio system and numerous emergency preparedness and infrastructure projects. Since 1999, this support has been directed at the upgrading of services through Emergency Communications for South Western British Columbia Incorporated (E-Comm).

On January 18, 2005 Council approved the following recommendation:

B. *THAT Council direct staff to report back with recommendations about the selection and cost implications of a new computer-aided dispatch (CAD) system to replace Altaris CAD for fire departments that use dispatch at E-Comm.*

PURPOSE

This report is in response to Council's request for a report back with recommendations and cost implications of a new CAD system to replace Altaris CAD. The report seeks Council's approval for increased ongoing and one-time funding to allow Vancouver Fire to transition to a new Intergraph CAD system as recommended by User Agency Selection Committees, new

fire hall alerting (FHA) and Mobile Work Station (MWS) systems, and outlines the impact these changes will have on the VFRS.

BACKGROUND

The existing Altaris Computer Aided Dispatch system was designed specifically for a combined Police, Fire and Ambulance dispatch service. Since 2001, Vancouver Fire has used the Altaris CAD system for fire dispatching services when remote use of software began at Fire Headquarters.

In July 2003, the VFRS Dispatch Office was moved and consolidated with E-Comm's Dispatch Centre. In 2004, E-Comm assumed the full responsibility for provision of fire dispatch staffing (including the VFRS). At that time, VFRS was also providing dispatch services for Garibaldi/Whistler, Port Moody and five (5) fire agencies (Gibsons, Half Moon Bay, Sechelt, Roberts Creek and Pender Harbour) on the Sunshine Coast. As a result, the dispatch services for these fire agencies were also consolidated into the E-Comm dispatch centre during the VFRS integration. Since early in 2004, E-Comm has provided all dispatch services and firehall alerting (FHA) functions for these departments. Richmond, Delta, and New Westminster Fire Departments began receiving dispatch services through E-Comm after the VFRS dispatch transition into E-Comm occurred.

On a July 20, 2004 Council report (RTS 04382), Council was advised of the transition of the Vancouver Police Department from Altaris CAD to Versaterm PoliceCAD to take advantage of integrated technology for dispatch and records management being provided to police forces across the province. At that time, Council was advised that with VPD gone, continuing to operate Alteris CAD could not be justified and the plan was to seek an alternative CAD solution for Fire agencies and BC Ambulance. The VPD migrated from the Altaris CAD to the Provincial Versaterm PoliceCAD in 2005. The ambulance service is scheduled to migrate to an Intergraph CAD System (as this report proposes for Vancouver Fire & Rescue) in 2007.

Vancouver Fire will therefore be the major remaining user of a CAD system designed for a much larger user base. To continue the use of Altaris CAD would be increasingly expensive, estimated to be approximately $1.1 million additional to bring the existing software and hardware to present day standards and requirements. These required upgrades would include proprietary software, updates for mobile terminals, server upgrades, and firehall alerting reprogramming.

DISCUSSION

Computer Aided Dispatch (CAD)

The VFRS currently uses the Altaris CAD system implemented by E-Comm in 1999 to support the Vancouver Police Department (VPD), the VFRS and the British Columbia Ambulance Service (BCAS).

Computer-aided Dispatch (CAD) systems are specifically designed to facilitate quick response to incoming emergency calls, rapid dispatch of required units, and documentation of incidents. The CAD system is an integral link between the dispatcher and the units in the field, and is critical in supporting the safe and effective allocation of resources. The CAD system must be integrated with communications systems, and computer terminals in responding vehicles, and assists the dispatcher with real-time status of incidents and units.

New technology, including Geographical Positioning Systems (GPS) improves safety and efficiency and improves response times. Ideally, the CAD system will provide the source incident data and response statistics to populate a database for creation of incident records for legal, statutory and statistical purposes. Therefore, the CAD and Records Management Systems (RMS) should be fully integrated.

Currently, the VFRS pays for services provided by E-Comm (which includes the VFRS portion of all related costs of E-Comm's Altaris CAD software) through the annual levy paid to E-Comm which is part of the department's annual budget. The current levy payment model for dispatch services (which includes the use of E-Comm's Altaris CAD software) was based on a cost sharing model that included police and ambulance agencies. As Police and Ambulance were the highest volume users of the Altaris CAD software, their portion of costs accounted for 95% of the total cost(capital and operating), leaving only 5% allocated to all fire agencies.

In 2004, E-Comm began working with the VFRS, other "Class A" shareholder fire departments and the BCAS to select a new CAD vendor. This process was completed early in 2006, selecting Intergraph's CAD system as the software application of preference. Intergraph was chosen because they meet the user requirements to the highest degree and they have a strong implementation history in Toronto, Calgary, Thunder Bay and Edmonton. The selection committee was unanimous in its choice of Intergraph for this service.

With the implementation of the new Intergraph CAD software for "Class A" shareholder fire agencies by E-Comm, the VFRS will become the fire agency having the highest volume of calls processed using the new Intergraph CAD software, and as a result, will pay approximately 55% of all costs associated with the implementation of the new Intergraph CAD system.

As part of the transition to Intergraph CAD, the existing Mobile Data Terminals utilized in fire apparatus will also change. Mobile Data Terminals function as text and status communicators with the Altaris CAD system. The current MDT system was installed in VFRS apparatus early in 1990 and has outlived its service life. The old MDT's will not function with either the new Intergraph CAD system or the new FDM Records Management System (RMS) that will be implemented at E-Comm for use by "Class A" shareholder fire agencies. The current MDT system uses Supervisory Control and Data Acquisition (SCADA) technology. SCDA's operating code is customized and proprietary, factors that make it difficult and expensive to modify.

Changing the MDT system currently used by the VFRS will require replacement hardware (mobile PCs) for VFRS apparatus to be purchase along with The new FHA system will require upgrades to the hardware installed in Vancouver fire halls.

The implementation of Intergraph CAD at E-Comm will require the replacement of the old MDTs with Mobile Work Stations (55 plus 2 spare mobile PCs) to be installed in all first response and support fire apparatus. In addition, Global Positioning System (GPS) units, wireless modems and other hardware and software to support mobile connections to remote databases will be required. These workstations will provide improved dispatch information, property information and hazard information, as well as new mapping capabilities.

Alternative - Retaining The Altaris System

Vancouver Fire is the major remaining user of a highly customized (and therefore expensive to maintain) system designed for a much larger tri-service user base. As a result, the costs of

remaining with Altaris are disproportionately high. For example, the Altaris server is reaching the end of its service life and will require replacement at a cost of $909,500. Total costs to bring the Altaris System up to date and enabling it to work with other E-Comm functions (including the new Records Management System and expansion to other municipalities) are as follows:

$ 909,500	Replacement of Server
$ 105,900	Phase II implementation – Altaris required upgrades
$ 48,300	Interface to B.C. Ambulance system
$ 48,300	Interface to new Records Management System
$1,112,000	Total

Additional operational shortcomings of Altaris CAD include:

— each future upgrade would require expensive customized programming
— the link with VFRS' Records Management system would be only one-way and would not allow property information to be transferred back to Altaris from the RMS.
— E-Comm would be using a separate dispatch system for VFRS and the Ambulance Service complicating their task and resulting in potential delayed dispatches.

The costs listed above are capital costs on which E-Comm would base an annual levy. E-Comm has calculated an incremental increase to the VFRS annual levy of $383,900 for the continuation of the Altaris system, compared to an Intergraph-based levy of $303,900, an additional annual cost of $80,000 to continue with a system that other participants have abandoned, or are in the process of replacing.

In addition, the Altaris-related Mobile Data Terminals have deteriorated over time, and can only be maintained by utilizing surplus used VPD terminals for spare parts. This replacement/repair process cannot continue indefinitely. Replacements for the existing Mobile Data Terminals, with their technologically obsolete 1986 configurations, are no longer available.

In summary, the retention of the current Altaris System is a poor option for the future, due to the cost of maintaining an ill-fit system to the Department's requirements, and the migration of other users to more flexible and current systems.

Fire Hall Alerting (FHA)

A Firehall Alerting System provides each Firehall with printed dispatch information, public address notification, and automatic light and audible alerts in support of each emergency call. The present custom Firehall Alerting (FHA) system was developed by Telesphere Communications Corporation of West Vancouver and is the only one of its kind in existence. This system was built to fulfill the general functionality requirements of fire users, primarily Vancouver. The current FHA system is connected to the Altaris CAD system using an interface developed by Telesphere and Northrop/Grumman. With the addition of Delta Fire/Rescue and New Westminster Fire Departments, the limits of the interface were reached. As a result of these limitations, E-Comm currently cannot offer FHA services to any new fire agencies, thereby preventing E-Comm from also offering full dispatch services to additional fire agencies.

The original vendor no longer has the capacity to support the current FHA and is not qualified to assist in the development of a new software interface. Three (3) of the FHA system developers have moved on to other technical specialties.

The current FHA system has identified deficiencies that will be costly to correct, cannot be expanded even if the deficiency is corrected, and cannot be interfaced to any other CAD platform. An independent study by an engineering firm estimated the cost to fix technological deficiencies in the Telesphere system at approximately $250,000, and this would still not enable the system to be expanded beyond its present day limits. As a result, the method of alerting fire stations in Vancouver needs to change.

When these problems were identified, E-Comm established a work group to research FHA systems currently in use in North America. Although many fire departments use custom built solutions, E-Comm's criteria required that the new system must have standard Commercial Off the Shelf (COTS) components to the greatest extent possible, be cost effective, and have the acceptance of other similar-sized fire agencies.

CADVoice by Locution was chosen as the replacement. This system is used effectively by numerous large fire departments in the United States, such as Seattle, Chicago and Los Angeles and is currently being implemented in the Edmonton Fire Department.

Already contained within the 2007 radio levy, $750,000 is allocated for FHA and will cover the software component of the system. However, end user agencies will be responsible for the provision of their own end user equipment. For Vancouver, this will be financed by E-Comm and payable through the CAD levy as part of the agency-specific costs noted above.

FINANCIAL IMPLICATIONS

This report provides Council with the best possible cost estimates for replacing the existing CAD software and contains a discussion of the total estimated cost to replace the City's existing CAD software, Fire Hall Alerting and Mobile Work Stations, and the main risks associated with the project.

Incremental Levy Costs

The ongoing annual cost to the City of Vancouver associated with the replacement CAD system, Mobile Work Stations and Fire Hall Alerting is estimated to be approximately $566,000, comprised of two main components described below. The system will be operational effective July, 2007.

- *E-Comm CAD Levy (net increase to Fire's Levy of $303,900 per year):* Fire's existing CAD budget levy is $105,900. The debt servicing portion of $64,206 will be payable until Altaris CAD is retired in 2013. The operating portion of $41,725 is available to reduce the cost of the replacement CAD and these ongoing savings have been taken into account in calculating the net incremental levy increase of $303,900. The total annual net increased cost to E-Comm of financing and operating the replacement CAD software is estimated to be $569,000, which will be fully recovered through levies charged to participating agencies. Cost components underlying this amount are detailed in Table 2 below.

According to the cost allocation model, the shared agencies are Vancouver, Richmond, New Westminster, Delta, Port Moody, Whistler and the Sunshine Coast Regional District. Vancouver will pay just under 54% of the shared annual costs. This share will increase if any of the agencies decline to participate. At this point, all agencies have verbally expressed a willingness to participate and are currently going to their respective Councils for approval. Table 1 summarizes these costs, and assumes full participation

- *City of Vancouver's Agency Specific Costs (estimated 217,400 per year):* Agency costs cover the purchase of Vancouver's Fire Hall Alerting System and Mobile Work Stations, including robust PCs, GPS modems and related peripherals. E-Comm has undertaken to finance this equipment through the levy for the initial purchase and subsequent replacements and the debt charge is estimated at $217,400 as itemised in Table 2.

TABLE 1.
CAPITAL COSTS: INTERGRAPH CAD,
MOBILE WORK STATIONS AND FIRE HALL ALERTING

	SHARED BY ALL PARTICIPANTS, PAID VIA E-COMM CAD LEVY	CITY OF VANCOUVER SPECIFIC COSTS PAID VIA E-COMM CAD/RADIO LEVY
1A. SHARED CAPITAL COSTS		
CAD Software	$1,421,000	
CAD Hardware & Related Software	$138,800	
CAD Implementation and Start-Up	$163,700	
Total CAD Shared Capital Costs	**$1,723,500**	
1B. CITY OF VANCOUVER AGENCY SPECIFIC CAPITAL COSTS		
MWS System (Rugged PCs, GPS Modems)		$521,200
Fire Hall Alerting System		$ 276,500
Total Agency Capital Costs		**$797,700**

The ongoing annual cost to the City of Vancouver associated with the system is estimated to be approximately **$566,000**, as described below. CAD Financing is 5.4% calculated semi-annually, 10.5 years amortization.

TABLE 2.

ESTIMATED INCREMENTAL COST DETAILS: INTERGRAPH CAD, MOBILE DATA TERMINALS AND FIRE HALL ALERTING

	TOTAL SHARED COSTS	ESTIMATED COV PORTION	% OF COV TOTAL ANNUAL COST
SHARED OPERATING COSTS			
Debt Charges – CAD Shared Capital Costs (Table 1A)	$217,900	$116,300	21%
E-Comm Staffing & Overhead to Run/Maintain - CAD	$187,400	$100,100	18%
Servers & Hardware Operating & Maintenance - CAD	$12,600	$6,800	1%
Software Maintenance Contract - CAD	$151,100	$80,700	14%
Total Shared Annual Costs (E-Comm CAD Levy)	**$569,000**	**$303,900**	
CITY OF VANCOUVER'S OPERATING COSTS – AGENCY SPECIFIC			
Debt Charges - MWS User Equipment (Table 1B) [1] CAD Levy		$147,500	26%
Debt Charges – Fire Hall Alerting Equipment (Table 1B) Radio Levy		69,900	12%
Operating Costs (MDT and GPS Maintenance, Data Transfer)		$44,700	8%
Total Agency Annual Costs		**$ 262,100**	
Total COV Annual Cost of Participation		**$ 566,000**	**100%**

Notes: To Table 1 & Table 2:

1. The City's MWS user equipment has a 4 year life cycle and the Fire Hall Alerting System has a 7.5 year life cycle. The Fire Hall Alerting equipment will remain as an ongoing project cost throughout the life of the CAD.
2. All figures are estimates, in 2006 dollars.

Debt Charges – Mobile Work Stations (estimated $147,500 per year)
As noted in Table 2, this cost represents the annual levy from E-Comm to fund the Mobile Work Station equipment.

Debt Charges – Fire Hall Alerting Equipment (estimated $69,900 per year)
As noted in Table 2, this cost represents the annual levy from E-Comm to fund the Fire Hall Alerting equipment.

Maintenance Costs (estimated $44,700 per year)
The ongoing maintenance component of $44,700 includes $33,000 for commercial wireless data service and $11,700 for the maintenance of MWS and GPS units and is included in the $262,100 total agency annual costs referenced in Table 2.

One-time Implementation Costs (estimated $101,200)
As with Fire's recent implementation of the new Records Management System, all suppression staff will be trained on the new CAD-related systems. The costs include; $11,000 for Sequel server client-accessed license purchase, $8,300 for the removal of MDTs from apparatus, and $81,900 for the training of all suppression staff on the CAD, Fire hall Alerting and Mobile Work Station systems.

Managing Financial Project Risk
Because this project capitalises on E-Comm's expertise related to implementing and managing shared systems among municipal agencies, and because CAD software technology can be purchased "commercial off-the-shelf," the risks inherent to this project can largely be anticipated and managed.

*Technical Risk***.**

These are considered to be minimal due to the software being COTS. Intergraph, the vendor of the CAD software to be used, has experience with similar-sized installations. The implementation team has communicated with the project manager who implemented a large, complex CAD system in Toronto Ontario, who has indicated that they are satisfied with the implementation and the software. The fact that Intergraph has a Canadian office located in Calgary could make this installation somewhat more straightforward than the installations whose software vendors are based in the United States.

Participation Risk

CoV Levy will increase if agencies choose not to participate in the new CAD system. The levy estimate provided in Table 2 is based on the assumption that there will be participation from the following agencies: Vancouver, Richmond, New Westminster, Delta, Port Moody, Whistler and the Sunshine Coast Regional District. Should any of the agencies choose not to join, the City's CAD levy will increase.

*Levy will decrease if additional fire agencies participate in the new CAD system***.** Should more agencies join either in the implementation phase, or at a later date, the CoV's levy will decrease.

IMPLEMENTATION PLAN

All portions of this report are to be implemented in mid 2007. This project will be coordinated by E-Comm to Vancouver Fire & Rescue's satisfaction.

CONCLUSION

As the City of Vancouver has committed to the provision of emergency dispatching services through E-Comm, the upgrades and expenditures detailed in this report are operationally necessary to provide service efficiency, safety, and an appropriate level of service to the public.

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