Wireless Radio & Low Volume Data Communication Strategy

General Committee

April 20, 2009

Agenda

- Objectives
- User needs summary (voice)
- Current Mix of Technologies
- User Needs summary (Data)
- Current and Upcoming Costs
- Other Municipalities – Voice Radio
- Alternative Solutions
- Private Radio System - Details
- Conclusions
- Next Steps

Objectives

- **Review Current Solutions**
  - Voice (two-way, Mike), Wireless Data
- **User Needs Study**
  - Town user groups –needs, satisfaction level, shortcomings
- **Alternative solutions**
  - Match user needs to technology alternatives & implications
- **Provide Recommendations**

User Needs Summary (voice)

- **Portable handheld and mobile (in-vehicle) radios**
- **Communications Patterns**
  - — One-to-Many users (Workgroups)
  - — One-to-One
- **Coverage – street level portable, in-building in Town hall and Operations Centres**
- **Advanced Features**
  - — Emergency button on radio
  - — Able to talk to different Town user groups (Operations, Bylaw, etc.) by changing channels
  - — A non-emergency dispatcher

Current Mix of Technologies

1. VHF two-way voice radio system:

- **1970s vintage**
- **Only provides one-to-many communications**
- **Deficiencies:**
  - 20% portable (hand held) radio coverage of Town
  - 50% mobile (in vehicle) radio coverage of Town
  - Old (mostly over 20 years), large, heavy handsets,
  - Operating against Industry Canada licensing regulations
  - Only one channel to share amongst 200+ users – congested, no privacy
  - Not considered a safety net, user rating - 1 out of 10
- **Positives: Inexpensive – negligible operating cost**

Current Mix of Technologies

2. Telus Mike "instant connect" portable radio:

- **1980 vintage**
- **Deficiencies:**
  - Coverage dead spots, difficult to operate, not rugged enough
  - Workgroups (one-to-many users) - is too expensive & turned off
  - User rating - 6 out of 10
- **Positives: Small handsets, lots of cellular features**
- **Expensive - renting airtime at cost of 46 cents per minute**

Current Mix of Technologies

3. Telus cellular phones:

- **Cellular phone**
  - One-to-one communications
- **Costs about 18 cents per minute**
- **Regardless of technology choice, some cellular will remain**

Overall Impact of current technologies:

- Operating 3 separate systems contributes to users' confusion
- Many users carry two or more devices
- Public networks are ineffective during blackouts and major storms

User Needs Summary (data)

- **Immediate user need for Automatic Vehicle Location (track vehicles)**
  - 200 Town vehicles
  - 65 contractors mobile units
- **Much smaller need for mobile laptops**
  - Limited high volume data transmission to backend business applications demand
  - Fire and Bylaw needs are most urgent

Current & Upcoming Costs (voice & data)

- **Voice:**
  - Current VHF two-way radio system — negligible
  - Telus “Mike - instant connect” portable 72 @ 46 ¢/min — $37K/yr
  - Telus “Mike-instant connect” cellular 151 @ 18 ¢/min — $127K/yr
  - Total voice cost: — **$164K/yr**
- **Data:**
  - Total Town AVL upcoming cost: — $135K/yr
  - Total Contractor AVL cost: — $43K/yr
  - Total data cost: — **$178K/Yr**
- **Total cost (data &voice):** — **$342K/yr**

Other Municipalities –Voice Radio

City/Town	2006 Population (thousands)	Main Voice Radio system - Capital Costs
Toronto	2600	Share with Toronto Hydro - $10M
Calgary	988	City owned - $6M
Ottawa	812	City owned - $10M
Edmonton	730	City owned - $6M
Mississauga	668	City owned - $4M
Winnipeg	633	City owned - $4M
Vancouver	578	City owned - $4M
Hamilton	504	City owned - $10M
London	350	City owned - $5M
Markham	**261**	**Mike Public Network**
Vaughan	238	**Mike Public Network**
Windsor	216	City owned - $6M
Kitchener	204	City owned - $3M
Oakville	165	**Mike Public Network, replacing 2009**

Alternative Solutions

Function	Current Path	Private Radio System	Join Regional System	Private Cellular
Individual Voice	Yes (Telus mike)	Yes	Yes	No, Use cellular
Group Voice	Yes (with upgrade)	Yes	Yes	No
Cellular Voice	Yes	No, Use cellular	No, Use cellular	Yes
AVL Data	Yes (public)	Yes (private)	Yes (private)	Yes (private)
Cost/year Over 10 yrs	$575K	$211K	$427K	$600K
Lifecycle		10-15 years	2013 4 year lifecycle	10-15 years
Future SCADA system		Yes ($40K)		Yes ($40K)

Private Radio System - Details

- **Recommended 2008, all digital technology**
- **Voice:**
  - Portable and mobile radios – small and feature rich
  - Individual and group communication, no cellular
- **Wireless Data**
  - Low speed data – AVL, Scada, AMR?
  - No high speed data for mobile laptops
- **Budgetary Design**
  - One radio site, 4 channels, 200 radios
  - Engineering, RFP, evaluation, supply of equipment and services
  - Capital Cost estimate - $835K + taxes (estimate, 2008)

Private Radio System - Details

- **Eliminate Mike "instant connect":** **$37K/year**
- **50% reduction in Mike "instant connect" with cellular:** **$63K/year**
  - *Total operational cost savings* *$100K/Year*
- **Avoid cellular costs for AVL on 200 Town vehicles:** **$135K/year**
- **Avoid cellular cost on 65 contractor vehicles:** **$43K/year**
  - *Total future cost avoidance* *$178K/Year*
- **Total cost savings/avoidance:** **$278K/year**

Private Radio System - Details

Cost savings/avoidance:	$278K/year
Cost of operating new system:	$45K/Year
Net cost saving/avoidance:	$233K/Year
Capital cost of new private system over 2 yrs:	$835K
Return on Investment:	3.5 Years
Lifecycle of new system (minimum):	10 years
Total savings in lifetime:	$1.5 Mil.

Conclusions

- Migrate the two-way voice radio communications and AVL traffic to a new private radio system
- Mandate employees to use two-way radio whenever possible
- Eliminate “Mike instant connect”; some cellular needs will continue
- Enrich Town facilities with wireless access points and higher bandwidth
- Opportunity to have a 7/24 Non-emergency dispatcher to improve productivity, safety of employees, & improve customer service

Next Steps

- **Approved 2009 budget for Phase I (infrastructure)** **$480,000**
  - **Detailed Engineering Design** **1.5 months**
  - — Coverage analysis – towers/sites, and AVL requirements
  - — Federal Industry Canada Licenses acquisition (may take several months)
  - — Department by department radio requirement gathering
  - RFP preparation, response & evaluation (phase 1) 3.5 month
  - RFP award by General Committee – Fall 2009
  - System implementation 6 months
- **Estimated 2010 budget for phase 2 (implementation)** **$355,000**