

## TRANSIT RADIO SYSTEM REPLACEMENT

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### EXECUTIVE SUMMARY

Radio communication is an essential tool for Calgary Transit operations to provide reliable and secure transportation services to the public. It is used by nearly 2,500 Calgary Transit personnel in roles which include; operators, supervisors, maintenance, security and training. Calgary Transit is currently using TELUS Mobility's Mike service for general two-way radio communications. TELUS Mobility has informed the City that it will be turning off its Mike network in December 2016.

The City owns a Motorola Digital Radio System (DRS) that is currently being used by Calgary Police Services (CPS), Calgary Fire Department (CFD), ENMAX, and other public safety agencies. Motorola completed a study in May 2015 indicating that with upgrades to the infrastructure they could accommodate the 2,500 transit users, as well as all Mike users from other City services.

To evaluate options for replacing the current radio communications, Calgary Transit worked with Federal Engineering Inc. to complete an alternative analysis. It was determined that joining the DRS system would be the most cost effective option to meet operational requirements to complete the project prior to the December 2016 deadline and would have a total cost of \$13.4 million.

### ADMINISTRATION RECOMMENDATION(S)

That the SPC on Transportation and Transit recommends that Council:

- 1) Approve a capital appropriation of \$13.4 million in Program 564 Calgary Transit Technology Upgrades to complete the needed infrastructure upgrade; purchase new compatible mobile units for all buses, trains, and auxiliary vehicles; and build a new and enhanced dispatch centre at our new Operations Control Centre (OCC2.0).
- 2) Fund this project by reallocating \$12 million in funding available in Program 829 NW LRT Extension to Rocky Ridge and \$1.4 million is available in Program 830 NE LRT Extension to Saddleridge.

### PREVIOUS COUNCIL DIRECTION / POLICY

None

### BACKGROUND

Radio communication is an essential tool for Calgary Transit operations to provide reliable and secure transportation services to the public. Calgary Transit, along with Corporate Security, Roads, and Waste & Recycling, has been using TELUS Mobility's Mike service for general two-way radio communications since 2001. TELUS will cease Mike radio service at the end of 2016, due to inability to source parts to continue to support the iDEN infrastructure.

In addition, Calgary Transit is building an Operation Control Centre (OCC2.0) with plans on dispatching from this centre in Q1 2017, and wishes to take advantages of advance communication system upon its opening.

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The City owned Calgary Digital Radio System (DRS) that is currently providing radio communications service to public safety services; Calgary Police Services (CPS), Calgary Fire Department (CFD), ENMAX and other public safety agencies, has been operational since 1997. The DRS is undergoing upgrades to its base station radio equipment to ensure Motorola continues to be able to operate reliably and provide replacement parts for upgrades and expansions.

### INVESTIGATION: ALTERNATIVES AND ANALYSIS

The City of Calgary engaged Federal Engineering, Inc. to provide consulting services for the development of replacement radio communications solutions for the existing Calgary Transit radio system. An extensive technical alternatives analysis was completed and a summary is provided below.

Based on user needs, requirements and business goals and objectives, Federal Engineering assessed viable technologies and deployment strategies. It is clear that each of the current standards-based technologies for land mobile radio systems would meet all of Calgary Transit's requirements. Federal Engineering and Calgary Transit's project staff developed preliminary timelines for two deployment strategies:

1. New system deployment: Procurement and deployment of a new replacement radio system (technology neutral) and user devices to support Calgary Transit's operations.
2. Existing system expansion: Expansion of the City's existing digital radio system (DRS) that is currently used primarily by public safety, including procurement of new user devices to support Calgary Transit's operations.

A new system deployment contains many risks such as unknown radio coverage issues, inability to lease tower space, inability to secure license frequencies through Industry Canada, and unknown operation and maintenance plans. Thus, the projected timeline for the second strategy is significantly shorter than deploying a new system, and is the approach most likely to be completed prior to December 2016. In addition, joining The City's DRS system brings other benefits such as being able to create talk groups with Police, Fire and Transit to coordinate "activates" during emergency situations, as well as sharing the cost of infrastructure maintenance; therefore, Calgary Transit decided to move forward with joining the existing DRS system.

### Stakeholder Engagement, Research and Communication

Onsite surveys and staff interviews were completed with Calgary Transit staff to develop the core requirements for a new radio system. These requirements were vetted against experiences with similar projects in other municipalities and knowledge of current and future trends in the wireless voice and data marketplace.

Calgary Transit's communications system is set up in talk group mode, allowing group users to hear each other but not all the chatter over the air. Also radios in buses interact with the Xerox CAD/AVL system so that requests to talk are made and approved by a dispatcher, ensuring

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someone is ready to listen to the request from the field. These Talk groups and Xerox interface are essential to safe and efficient operation in the new radio system.

In order to increase cost efficiency, it has been determined that the number of portable user devices will be decreased by approximately 2300 at the outset and additional subscribers added on an as-needed basis.

### **Strategic Alignment**

This project aligns with Council's strategic goal for safe and reliable infrastructure.

Municipal Development Plan/Calgary Transportation Plan

- Key Direction for Land Use and Mobility #8: Optimize Infrastructure
- Transportation Goal #7: Ensure transportation infrastructure is well managed.

RouteAhead

- Direction N1: Complete capital projects that are critical to the existing network.

2020 Sustainability Direction:

- Goal: Smart Growth and Mobility choice, Objective: Provide Safe, Reliable and Affordable Public Infrastructure

### **Social, Environmental, Economic (External)**

Retaining a stable communications system is paramount to the safety of our employees and the reliable operation of Transit service. By increasing capacity and integrating into the existing CPS and CFD radio system, we are enabling better communication and coordination among departments which interact directly with the public. In addition, the network will be subject to municipal governance and be open to configuration changes (including capacity and membership) while providing sustainability over the next decade.

No additional land is required for tower location past the existing planned improvements. Lower GHG emissions for heating and cooling requirements will result from co-locating into existing radio facilities.

Using existing radio infrastructure will ensure that costs for capacity improvements and ongoing maintenance are shared between multiple users. Rather than building a new system with associated installation and maintenance charges, all expenditures assist in the ongoing operation of the existing network. A single, wholly-owned and operated system will be less expensive than two separate systems and allows for greater control and administration on a municipal basis.

### **Financial Capacity**

#### **Current and Future Operating Budget:**

Current fees for iDEN users are approximately \$25-35/month. Fee for DRS user are still being set by the governance committee but are estimated at \$40/month and will be used toward

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system maintenance and expansion. Any increase in total annual operating costs will have to be absorbed within Calgary Transit's existing Operating Budget.

### Current and Future Capital Budget:

\$13.4 million is required to replace the existing radio system.

- \$2.1 million for increase to infrastructure capacity

- \$2.4 million for new console for the OCC2.0

- \$4.4 million for subscriber (mobile radios) units

- \$4.5 million for installs and interfaces to existing system like CAD/AVL, PA, Help Phones

Funding is available from existing capital budgets in the Transportation Department: Program 829 NW LRT Extension to Rocky Ridge \$12 million (primarily Municipal Sustainability Initiative (MSI) grants and Fuel Tax), and Program 830 NE LRT Extension to Saddleridge \$1.4 million (primarily MSI grants). Funding is required in Program 564 Calgary Transit Technology Upgrades.

### Risk Assessment

Ensuring a replacement system is operational by December 2016 is the greatest risk of this project. Without an effective and reliable communication system, there will be loss of instantaneous access to people and the exchange of information within the service area. There will be loss of business continuity. Operators will not be able to operate buses and CTrains without reliable means of communication. Dispatcher, operators, peace officers and maintenance staff would not be able to get support for incidents that occur in the field. Updated information on delay or changes to route/schedule cannot be passed to driver. The provision of safe, reliable and accessible transit service to the public will be compromised. In addition, Calgary Transit's new OCC2.0 is planning on using the new technology upon its opening to avoid a costly transition from iDEN to the replacement technology.

### REASON(S) FOR RECOMMENDATION(S):

The TELUS Mike iDEN network has been a critical part of Calgary Transit's Operation for the past 14 years, but will be turned off in December of 2016

The Motorola DRS system is a robust system with the full support of CPS, CFD, and Motorola, to remain reliable for those essential public safety services. The increased radio capacity will benefit Calgary Transit as well as existing DRS users by efficiently sharing resources. In addition, with a larger system, cost savings and channel reuse is possible.

The Motorola system provides additional benefits as a proven interface to our CAD/AVL bus system, a robust Console solution that can serve as an Integrated Communication System (ICS), and a large user base across North America

### ATTACHMENT(S)

None