NEW REQUESTS
Capital

Requestor: Jim MacDonald
Cost Center for Service Review: Water Services
Title of Initiative: Communications Upgrade

Summary:
The Water Services department manages 20 sites associated with the distribution of potable water, collection of sanitary and the treatment of wastewater to meet regulatory, public safety, and environmental requirements. The Supervisory and Control and Data Acquisition (SCADA) system collects critical information from each of these locations and provides the Water Services Operator with real time confirmation of status at each site. This SCADA information is collected by several different methods ranging from Telus copper communication line, ethernet radio to fiber optic connection.

The existing radio equipment can no longer be replaced due to them being legacy systems no longer supported by the manufacturer. Several critical radios are failing and the current approach to rebooting this system involves cycling power to the equipment. Should this equipment fail, the Water Services Operators will be required to monitor each location, in person, multiple times each day.

The Water Services department has completed an assessment of communication technologies to identify the most cost effective and reliable system to deploy to each location to provide a robust SCADA system.

The cost to complete the detailed engineering design, procure and install the upgraded radio system is estimated at $1,020,500.

Description:
The Town's existing system consists of 20 water and wastewater facilities. The remote water and wastewater stations communicate to the existing SCADA network using GE MDS Transnet 900. Aging radio equipment at the remote stations has been causing sporadic communication failures. A fiber optic trunk links the SCADA network from the fleet building to the Town Hall.

The Water Services department engaged the Engineering Contractor (AECOM) to complete a revision of appropriate communication technologies to provide a recommendation that would standardize each sites system, improve reliability ensure accurate communication between this critical infrastructure. AECOM recommends that the Town install 420 MHz radio system in a licensed frequency band at all locations. There will be 4 key sites that act as a "backbone" to the system. Local remote sites will communicate to these backbone locations. The location of these backbone sites is such that a loop is created in the SCADA communication system providing a higher degree of functionality.

A licensed frequency radio system provides numerous advantages over the unlicensed 900 MHz radio system currently in operation.

- The radios are permitted to use much higher power output transmitters. This permits longer ranges and better ability to deal with obstructions which improves the reliability and quality of the network as fewer message packets will be lost and need to be retransmitted.

- The licensed band frequency is better able to penetrate through or go around obstruction in their path. This will improve the network reliability in poor weather conditions and as trees continue to grow will ensure the network performance will not degrade over time.
- Elimination of any potential interference from other devices as frequencies are allocated by the Federal Government to the user and are not shared. This will improve the reliability and quality of the network.

As part of this communication study, the Water Services completed a detailed assessment of current infrastructure and found numerous locations to be out of compliance with the Canadian Electrical Code.

The monitoring of the SCADA system is a regular failure of the Water Services system and requires immediate attention of other TOB departments. Replacement of this system will reduce the burden on the Water Services and Information Technology departments.

Capital Costs/Funding Source(s):

	2023
Detailed Engineering	$100,000
Radio Equipment	$240,000
Material	$130,000
Contractor Labour	$315,000
Project Contingency (30%)	$235,500
Total	**$1,020,500**

Operating Costs:

	2023	**2024**	**2025**
Annual Monitoring Costs	$0	$15,000	$15,000
Total	**$0**	**$15,000**	**$15,000**

Annual monitoring of the communication system provided by a third party specialist is recommended to ensure that the communication system continues to link the Water Services critical assets and ensure the water distribution, sanitary collection and wastewater treatment facility are monitored at all times.

Resources Required to Implement & Maintain:
The project would be managed by the Water Services department with support from external consultants.

Estimated Delivery Date:
Detailed Engineering is expected to be completed by April 2024.
Radio systems will be procured and cataloged by a third party installation contractor by Q3, 2024. The radio system will be replaced over several months in Q4, 2024.

Supporting Strategic or Tactical Plan?
This upgrade continues to support the Towns 2019 – 2022 Strategic Plan.

Supporting Materials:
Attachment – **Confidential** AECOM Communication Infrastructure Assessment

2023 Budget Criteria:

a) 3rd Party Funded, i.e., grants, donations, etc.
b) COVID related / safety / legislated
c) Lifecycle maintenance / asset management
d) Supports Economic Recovery
e) Significantly move towards targets in Strategic Plan with outstanding projects
    i. Improving Active Routes and Transportation
    ii. Addressing Cost of Living
    iii. Nurturing a Model Environmental Community
    iv. Preserving Cultural Vibrancy
    v. Strengthening Emergency Management and Wildfire Preparedness