BRAMPTON

Report
Staff Report
The Corporation of the City of Brampton
6/19/2024

Date: 2024-06-07

Subject: **Request to Begin Procurement – Design, Implementation, Support and Maintenance for an Advanced Traffic Management System (ATMS) for an Eight (8) Year Period with one (1) additional two (2) year optional renewal - All Wards**

Contact: **Nelson Melendez, C.E.T.,**
Supervisor, Traffic Signals
Road Maintenance, Operations & Fleet

Report number: Public Works & Engineering-2024-540

RECOMMENDATIONS:

1. That the report titled **Request to Begin Procurement – Design, Implementation, Support and Maintenance for an Advanced Traffic Management System (ATMS) for an Eight (8) Year Period with one (1) additional two (2) year optional renewal - All Wards** to the Committee of Council meeting of June 19, 2024, be received; and
2. That the Purchasing Agent be authorized to commence procurement of an Advanced Traffic Management System including design, implementation, and maintenance for an Eight (8) Year Period with one (1) additional two (2) year optional renewal.

OVERVIEW:

- **This report is to obtain Council authority to begin procurement for Design, Implementation, Support and Maintenance for the Advanced Traffic Management System (ATMS) for an Eight (8) Year Period with one (1) additional two (2) year optional renewal.**
- **The City has a requirement to provide traffic control/management services for:**
    - **City of Brampton's 388 signalized intersections**
    - **The Region of Peel's 204 Signalized Intersections (operated and maintained by the City of Brampton)**

- **Ministry of Transportation's 13 signalized ramps (operated and maintained by the City of Brampton)**
- **The City's Transit Signal Priority System on Zum Routes**
- **The City's Emergency Vehicle Priority System – City Wide**
- **Queen Street Bus Rapid Transit (BRT) - Future**
- **Hurontario Light Rail Transit (LRT) - Under Construction**
- **Other additional smart City devices utilized within the field.**

- **The Advanced Traffic Management System (ATMS) provides real-time remote monitoring and control of traffic signals and other ATMS field devices/systems as listed above.**
- **Remote access is necessary to monitor the health of the ATMS system and to make signal timing changes to address traffic congestion or to correct operational issues on the City's Road Network.**
- **The ATMS also monitors and collects important statistical information from transit priority corridors such as the Zum network and soon from light rail and rapid bus corridors such as the Hurontario Light Rail Transit (LRT) and Queen Street Bus Rapid Transit (BRT).**
- **The ATMS is a critical emergency management component during an emergency and/or disaster related to natural, human-induced or technological crisis. The ATMS would provide situational data that can be used to develop emergency signal timings to deal with specific events.**
- **The ATMS system is a critical database system used for the storage of signal timing databases which allows staff to fulfill record retention requirements and freedom of information requests.**
- **The ATMS is a key component in the City's ability to deliver Vision Zero programs.**

BACKGROUND:

Traffic signals are currently installed at over 605 intersections within the city, including Regional-Owned and Ministry of Transportation Ontario (MTO) intersections which are operated and maintained by the City. Communications to these intersections via the City's Traffic Management Centre (TMC) are established through City-owned PSN fiber optic network and Rogers LTE cell modems. The connection between the Management Centre and field devices is made possible by the ATMS central software which is the nerve center of the ATMS. The ATMS software provides monitoring and remote command capabilities which are vital to the operation of the City's traffic signals network. Currently, the City operates MaxView a Q-Free software product which is distributed and supported in Ontario by Tacel Traffic Limited.

A disruption to the ATMS software operation would result in a significant reduction in the City's ability to operate the signal system and respond to emergencies. A lack of

monitoring and control capabilities would reduce our ability to implement congestion management solutions on the City's road network.

The ATMS system also provides a vital lifeline by providing remote clock synchronization of all field devices including traffic signal controllers. Losing automatic clock synchronization would result in serious traffic signal synchronization issues which can lead to significant traffic congestion across the City's road network. When disconnected from the system, traffic signal controller clocks can drift several seconds in a couple of days leading to unsynchronized traffic signals and the only way to correct the problem would be to have staff manually update the clocks on the entire network.

CURRENT SITUATION:

The current system, MaxView by Q-Free, was implemented over seven years ago has reached the end of its life. The typical life cycle of an ATMS is approximately 10 years but the current system's issues with unsupported Microsoft applications have unexpectedly accelerated the current system replacement cycle. The system is not able to be upgraded and the underpinning technology (i.e. operating system) is no longer supported. This presents cybersecurity issues for the City's computer network. Since 2021, the system has been at the end of its life cycle, and its ongoing operation cannot be guaranteed from day to day. Traffic Signals have worked with IT to reduce any system risks.

In addition to internal operational needs and concerns, staff are also faced with the challenge of supporting the implementation of the Hurontario Light Rail Transit (LRT) project. To support the LRT construction deadlines, the City must have a new system in place no later than Q4 of 2024. The City's failure to implement a new dependable ATMS software could pose delays and cost overruns to the Hurontario Light Rail Transit (LRT) project. Phase 1 of the ATMS deployment is aimed at bringing fifteen (15) Hurontario Light Rail Transit (LRT) signalized intersections online. An additional one hundred intersections would be brought online during subsequent deployment phases in 2025 under the same contract.

Additionally, the ATMS monitors and controls other systems such as ZUM Transit Signal Priority, Emergency Vehicle Preemption, Intelligent Count Station, and the future deployment of the School Zone Flasher System. All these systems would be impacted by a ATMS system outage, therefore, the impact of an ATMS system outage expands beyond the operation of traffic signals.

SUMMARY:

The Traffic Signals Section is required to replace the City's ATMS system to fulfill both internal and external needs. Internal needs can be mitigated temporarily but not indefinitely. Losing the system entirely would have a negative impact on several critical

City services such as traffic signal progression, transit signal priority and emergency vehicle preemption. In terms of external needs, the Hurontario LRT presents a challenge as the project's timelines need to be met to avoid any negative impacts on the larger project. The plan is to award a contract to achieve full deployment on fifteen (15) intersections on the Hurontario LRT Corridor by the end of 2024. Please find an anticipated project schedule below:

CORPORATE IMPLICATIONS:

Financial Comments:

Funding for the design and implementation of a new Advanced Traffic Management System (ATMS) and subsequent support and maintenance for year one (1) is available in the approved capital budget within the Public Works and Engineering and Corporate Support Services Departments. Departmental staff will ensure that sufficient funding for the annual support and maintenance is included in future operating budget submissions and presented to the Mayor for consideration.

Purchasing Comments:

A public Procurement Process will be conducted, and the Bid submissions shall be evaluated in accordance with the published evaluation process within the bid document. Purchase approval shall be obtained in accordance with the Purchasing By-law.

All communication with Bidders involved in the procurement must occur formally, through the contact person identified in the Bid Document.

STRATEGIC FOCUS AREA:

This report fulfills the Strategic Focus of Transit and Connectivity by improving the day-to-day operations of the corporation and streamlining service delivery, effectively managing municipal assets, and demonstrating value for money of City programs and services.

The modernization of the traffic signal assets keeps the signal network in a state of good repair and thus improving safety for all road users. By modernizing the system, we will be able to efficiently move people and goods on the City's road network.

The implementation of a new ATMS system will fulfill the focus on Transit and Connectivity of our growing transportation network including assisting in the efficiency of LRT and BRT transit corridors. Advanced system functionality will also allow us to enable system features that improve connectivity for all road users.

CONCLUSION:

We are seeking Council approval to proceed with an RFP to procure a replacement Advanced Traffic Management System. The new central software platform will provide real-time System monitoring, Remote Intersection Control, High Resolution Data Analytics, ATMS Asset Management Control, Traffic Congestion Management, Transit Signal Priority Control on Zum, LRT and BRT corridors, Timing Plan Scheduling, Adaptive Control Functionality and Signal Timing Database Management.

To complete this project in a timely manner, it is recommended that Council authorize the Purchasing Agent to commence procurement, as described in this report.

Authored by:

Nelson Melendez, C.E.T.
Supervisor, Traffic Signals
Road Maintenance, Operations & Fleet

Reviewed by:

Shane Loftus
Manager, Transportation Right-Of-Way & Safety
Roads Maintenance, Operations & Fleet

Approved by:

Peter Pilateris M.A.Sc, P.Eng.
Commissioner,
Public Works & Engineering

Approved by:

Marlon Kallideen
Chief Administrative Officer