BRAMPTON

Report
Staff Report
The Corporation of the City of Brampton
7/10/2024

Date: 2024-07-03

Subject: **Request to Begin Procurement - Design, Implementation, Support and Maintenance for the Advanced Traffic Management System (ATMS) - All Wards**

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

Report number: Public Works & Engineering-2024-612

RECOMMENDATIONS:

1. THAT the report titled **"Request to Begin Procurement - Design, Implementation, Support and Maintenance for the Advanced Traffic Management System (ATMS) - All Wards"** to the Council meeting of July 10, 2024, be received; and
2. THAT the Purchasing Agent be authorized to commence procurement of an Advanced Traffic Management System (ATMS) including design, implementation, and maintenance.

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 a two (2) year period with ten (10) – one (1) year optional renewals.**
- **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.**

- **An Agnostic ATMS ensures that the system will remain compatible with emerging technologies when installed and into the future, beyond the duration of the RFP term and renewal lengths.**

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.

Additionally, the ATMS monitors and controls other systems such as ZUM Transit Signal Priority, Emergency Vehicle Preemption, Intelligent Count Stations, 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 of Analysis and Staff Recommendation

Staff have benchmarked term lengths and ATMS system lifespans with various municipalities and have determined that there are no economies of scale for longer term or multi-year procurements. The cost is largely based on the system cost and the number of deployments required. Regardless of the term length, the cost would incorporate the system price plus 600+ intersection deployments.

The term recommended by staff, provides the most efficient deployment of the new ATMS system, while maintaining flexibility for the City to explore different technologies in the future, should there be a desire.

Procurement Term Cost:

The anticipated average useable life span of an ATMS is 10-15+ years. The requirement for an agnostic system will ensure that the ATMS remains compliant with industry standards for the entirety of its life cycle, as agnostic systems must be continually updated to be able to utilize emerging controller and smart system technologies.

Purchase ATMS – two (2) year term with ten (10) - one (1) year support and maintenance renewals.

Initial Term would include: full deployment at 600+ intersections, integrations with current smart detectors, intelligent count stations, LRT and future BRT with Support and Maintenance for 1 year.

Support and Maintenance after year 1 and renewal terms would be requested as part of the annual Traffic Signals Operating budget.

End of Term Implications:

At the end of the initial term, the ATMS will be fully deployed across all intersections within the City of Brampton. Once the system is fully deployed, the only ongoing costs will be the Operational Support and Maintenance fees contained within the Operating budget. The City currently pays an annual support and maintenance fee out of our Operational budget for our existing ATMS; the new annual ATMS Support and Maintenace costs are expected to be in line with our current system.

At the end of the initial term and/or at any time during the renewal terms, the City may issue a new RFP for a new ATMS. If the City is satisfied with the ATMS, the City may also look to extend the Support and Maintenance agreements beyond the initial and renewal terms with the successful proponent, should the ATMS remain up to date with emerging technologies and to maximize the anticipated lifespan of the ATMS.
A Service Level Agreement for continued Support and Maintenance with the successful proponent would need to be executed for additional terms until such time as the City chooses to go back to market for a new ATMS vendor.

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 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 Q1 2025. Please find an anticipated project schedule below:

Council Approval	July 2024
RFP Issue	August 2024
RFP Closing	September 2024
PO Issuance / Commencement	November 2024
Proof of Concept and Testing	December 2024
Deployment on LRT Corridor	February 2025

CORPORATE IMPLICATIONS:

Financial Implications:

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.

Other Implications:

Purchasing Implications:

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 Improve the Connectivity and Livability of Streets and Infrastructure 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 good 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 align with the focus on Enhancing Transit Services of our growing transportation network including assisting in the efficiency vehicle traffic, including LRT, BRT and Fire prioritization, within our 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 Advance Traffic Management System for a two (2) year period with ten (10) – one (1) year optional renewals.

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.

Authored by:

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

Reviewed by:

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

Approved by:

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

Approved by:

Marlon Kallideen
Chief Administrative Officer