



**CITY OF HAMILTON**  
**PUBLIC WORKS DEPARTMENT**  
**Transportation Division**

<b>TO:</b>	Chair and Members Public Works Committee
<b>COMMITTEE DATE:</b>	December 4, 2017
<b>SUBJECT/REPORT NO:</b>	Advance Traffic Management System (ATMS) - City Wide Phase (PW15006a) (City Wide)
<b>WARD(S) AFFECTED:</b>	City Wide
<b>PREPARED BY:</b>	Robert Declair 905-546-2424, Extension 4391  Martin White, C.E.T. 905-546-2424, Extension 4345
<b>SUBMITTED BY:</b>	John Mater, C.E.T. Associate General Manager and Director of Transportation Public Works Department
<b>SIGNATURE:</b>	

**RECOMMENDATION**

- (a) That Kimley-Horn & Associates be approved under Procurement Policy #14 Standardization to:
  - (i) Supply all goods and services associated with the city wide phase of the Advanced Traffic Management System (ATMS) implementation for an estimated total one time contract amount of \$1,742,000;
  - (ii) Provide ongoing maintenance of the KITS-Kadence Advance Traffic Management System for an estimated four year contract amount of \$268,000 with the terms of the service maintenance agreements ending on December 31, 2021;
- (b) That \$982,000 of the \$1,742,000 for the City Wide ATMS implementation be funded from the approved 2017 Capital Project ID 4661720001 – ATMS;
- (c) That \$760,000 of the \$1,742,000 for the Transit Signal Priority development be funded from the approved Public Transit Infrastructure Fund Project #HAM-005, Project ID 5301755700 Transit Priority Measures on A line;
- (d) That the Annual Maintenance fee estimated at \$67,000 per year (four year contract amount \$268,000) be funded from the Traffic Operations & Engineering annual operating account 55916-466045;

---

*OUR Vision: To be the best place to raise a child and age successfully.*

*OUR Mission: To provide high quality cost conscious public services that contribute to a healthy, safe and prosperous community, in a sustainable manner.*

*OUR Culture: Collective Ownership, Steadfast Integrity, Courageous Change, Sensational Service, Engaged Empowered Employees.*

- (e) That the General Manager of Public Works, or their designate, be authorized and directed to enter into and sign, on behalf of the City of Hamilton, in a form satisfactory to the City Solicitor, all negotiated agreements and associated documents to implement recommendation (a) with Kimley-Horn & Associates.

### **EXECUTIVE SUMMARY**

On February 11, 2015 City Council approved Report PW15006 on the Procurement Policy #14 - Standardization of Advance Traffic Management System (ATMS) Central Software for the creation of a central traffic control system to monitor traffic flow and operation. As part of this report Council approved the KITS-Kadence Advance Traffic Management System as the City's standard for central traffic control software. An agreement to supply core software, controller and field integration and testing support was subsequently negotiated and signed in the amount of \$695,000.00 USD with Kimley-Horn & Associates. The Pan Am phase of this central traffic control system was installed and completed for the Pan Am Games and the agreement has now expired. The balance of the central traffic control system now needs to be implemented city wide and a new agreement needs to be completed with Kimley-Horn & Associates. This agreement will have a completion date of December 31, 2021.

The City of Hamilton's road network is controlled by approximately 600 traffic signals. For the Pan Am Games, approximately 100 of these signalized intersections were connected and controlled through the KITS-Kadence Advance Traffic Management System. To expand this system city wide this phase will provide connection to approximately 500 remaining traffic signals. Work is required from Kimley-Horn & Associates who are the provider of the KITS-Kadence Advance Traffic Management System to complete this task.

This additional task will include the following:

- Database creation of signal timing plans
- Congestion Management software design, deployment and evaluation
- Transit Signal Priority software design, testing and evaluation

In order to connect an existing traffic signal to the KITS-Kadence Advance Traffic Management System, a database must be created for each signalized intersection which contains traffic signal timing parameters and settings. This task will predominately be completed by Kimley-Horn & Associates staff, with direction and assistance by existing City of Hamilton staff.

KITS-Kadence Advance Traffic Management System has the capability to monitor and adjust traffic signal timings to address congestion issues. This is referred to as the Congestion Manager software. Kimley-Horn & Associates will develop and tailor a specific Congestion Management software system for the City of Hamilton. This software will become the property of the City of Hamilton.

---

*OUR Vision: To be the best place to raise a child and age successfully.*

*OUR Mission: To provide high quality cost conscious public services that contribute to a healthy, safe and prosperous community, in a sustainable manner.*

*OUR Culture: Collective Ownership, Steadfast Integrity, Courageous Change, Sensational Service, Engaged Empowered Employees.*

**SUBJECT: Advance Traffic Management System (ATMS) – City Wide Phase  
(PW15006(a)) (City Wide) - Page 3 of 6**

---

KITS-Kadence Advance Traffic Management System has the capability to provide Transit Signal Priority software operation. This is a system whereby the traffic signal timings can be adjusted to improve transit vehicle operating times through the recognition of approaching transit vehicles. This is referred to as Transit Signal Priority. Kimley-Horn & Associates will develop and tailor a specific Transit Signal Priority software system for the City of Hamilton. This software will become the property of the City of Hamilton.

Development of the Congestion Manager software and Transit Signal Priority software will be undertaken in conjunction with the city wide expansion of the KITS-Kadence Advance Traffic Management System. The Transit Signal Priority software development will be completed by March 31, 2019. The city wide expansion of the Advance Traffic Management System is expected to be completed by 2020 and the Congestion Manager software is expected to be completed by the end of 2021.

Lastly Kimley-Horn & Associates will provide on-call services and annual maintenance of the entire KITS-Kadence Advance Traffic Management System. The City of Hamilton will need to enter into a Maintenance Agreement with Kimley-Horn & Associates for a multi-year period ending December 31, 2021.

***Alternatives for Consideration – See Page 6***

**FINANCIAL – STAFFING – LEGAL IMPLICATIONS**

**Financial:**

The total estimated one time cost for the services and tasks to be provided by Kimley-Horn & Associates are as follows:

One Time Only Capital Expenditure

Approved 2017 Capital Project ID 4661720001

Database Creation	\$ 665,000.00
Congestion Manager Software	<u>\$ 317,000.00</u>
Sub-Total (A)	\$ 982,000.00

One Time Only Development Cost

Approved Public Transit Infrastructure Fund (PTIF) HAM-005, Project ID 5301755700

Transit Signal Priority Software	\$ 760,000.00
Sub-Total (B)	\$ 760,000.00
Total Estimated cost (A)+(B)	\$1,742,000.00

---

*OUR Vision: To be the best place to raise a child and age successfully.*

*OUR Mission: To provide high quality cost conscious public services that contribute to a healthy, safe and prosperous community, in a sustainable manner.*

*OUR Culture: Collective Ownership, Steadfast Integrity, Courageous Change, Sensational Service, Engaged Empowered Employees.*

Annual Maintenance Fee of \$67,000.00 annually (four year contract amount \$268,000.00) be funded from the Traffic Operations & Engineering annual operating account 55916-466045.

**Staffing:** There are no staffing implications associated with this report.

**Legal:** If the recommendations are approved, a Contract for Consulting Services and a Maintenance Agreement, along with associated documents, will have to be drafted.

## **HISTORICAL BACKGROUND**

On February 11, 2015 City Council approved Report PW15006 on the Procurement Policy #14 Standardization of Advance Traffic Management System (ATMS) Central Software Package. Kimley-Horn & Associates are the provider of this Advance Traffic Management System (ATMS) Central Software Package which is called the KITS-Kadence Advance Traffic Management System. The Pan Am phase of this system was installed and completed for the Pan Am Games. New consulting service and maintenance agreements need to be entered into between the City and Kimley-Horn & Associates for the city wide installation phase of the system.

This new central system replaces the old traffic control system, which was built in the 1970's and used obsolete technology, fails on a regular basis and requires immediate upgrades to prevent a full system failure. In particular, the communications network connecting the signal system is limited, unreliable and antiquated and lacks the ability to adapt and react to changing travel demands and requires extensive resources (staff time) to modify and adjust operating parameters. The old system also had limited remote troubleshooting capabilities and event notification which also impacted staff resources (staff must travel to the site to troubleshoot problems and reset controllers). In short, the old system is obsolete and requires substantial upgrades.

To address these needs the City of Hamilton undertook a number of initiatives to upgrade and modernize the City of Hamilton's traffic control system. These initiatives included:

- The implementation of a new, high-speed wireless communication network to connect the traffic signal system;
- The installation of new video detection technology at critical locations to sense and collect high resolution vehicle movement data as well as remotely monitor trouble spots and incidents (remote surveillance);
- The upgrading of field electrical systems to improve overall system reliability;
- The construction of a new Traffic Management Centre to allow staff to remotely monitor and modify traffic signal operations; and
- The installation and integration of a central software system to oversee and control the operation of the road network in real time or near real time (adaptive/responsive control).

---

*OUR Vision: To be the best place to raise a child and age successfully.*

*OUR Mission: To provide high quality cost conscious public services that contribute to a healthy, safe and prosperous community, in a sustainable manner.*

*OUR Culture: Collective Ownership, Steadfast Integrity, Courageous Change, Sensational Service, Engaged Empowered Employees.*

The ultimate goal of these combined initiatives is to create an integrated system of traffic signals and other dynamic traffic control devices that will maximize the efficiency of the existing road network by recognizing, adapting and reacting to changing road conditions in real-time. Beyond automatically adjusting for typical daily variation or small incidents, this connected system will allow staff to identify major incidents such as arterial road and highway closures, and design and implement response plans remotely and proactively from the Traffic Management Centre.

To monitor and help manage traffic during the Pan Am games the KITS-Kadence Advance Traffic Management System was implemented in the Pan Am games corridor at approximately 100 intersections. It is now necessary to extend this system city wide to an additional 500 traffic signal locations.

### **POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS**

The KITS-Kadence central control software system produced by Kimley-Horn and Associates has become the City's standard for centralized traffic control and was approved under Procurement Policy for the City of Hamilton, By-Law No. 13-317, Policy #14–Standardization. Furthermore, the City is required to maintain the Traffic Signal System network in compliance with the Minimum Maintenance Standards for Municipal Highways, O. Reg. 239/02, under the Municipal Act, 2001, S.O. 2001, c. 25 and the Highway Traffic Act, R.S.O. 1990, c. H.8.

### **RELEVANT CONSULTATION**

To assist the City of Hamilton in selecting the most appropriate software package, in 2014 staff retained the services of Parsons Inc. through a Roster Assignment. Parsons Inc., are recognized as a world-wide leader in the development, design and implementation of ATMS and have assisted other municipalities in Ontario and across Canada with the selection of appropriate central software packages. Parsons Inc.'s knowledge base combined with their connection and access to the major software developers proved invaluable during the evaluation.

Staff have consulted with Hamilton Street Railway (HSR) on Traffic Signal Priority Development. Staff have also consulted with Kimley-Horn & Associates regarding consulting services and maintenance agreements.

### **ANALYSIS AND RATIONALE FOR RECOMMENDATION**

The overall operation and effectiveness of any Advanced Traffic Management System (ATMS) is ultimately defined by how well the central control software package can meet the goals and objectives set for the system. The selection of an appropriate software package based on the user's needs and requirements is the most important decision a municipality will make when developing or upgrading an ATMS. As the needs of all municipalities vary greatly, so do the capabilities and functions of the various central control software packages that are available.

A detailed evaluation of the available central software packages was undertaken by Parsons Inc. From this evaluation the KITS-Kadence system was recommended as the

---

*OUR Vision: To be the best place to raise a child and age successfully.*

*OUR Mission: To provide high quality cost conscious public services that contribute to a healthy, safe and prosperous community, in a sustainable manner.*

*OUR Culture: Collective Ownership, Steadfast Integrity, Courageous Change, Sensational Service, Engaged Empowered Employees.*

preferred system. This system had the functionality, compatibility, flexibility and resources required to install and integrate a robust, state-of-the-art, central traffic control system by the Pan Am Game deadline. The KITS-Kadence system is also a true agnostic system which can work with multiple controller and hardware configurations and will not require the City of Hamilton to accelerate their controller replacement program in order to achieve the desired benefits of an ATMS. Furthermore, Kimley-Horn demonstrated that KITS-Kadence will work with the City's existing PEEK 3000E controllers and was the only vendor to verify that they have an existing data sharing agreement with PEEK.

Report PW15006 recommended the Standardization of an Advance Traffic Management System (ATMS) Central Software Package using the Kimley-Horn & Associates KITS-Kadence Advance Traffic Management System as per Procurement Policy #14. This report was approved by City Council on February 11, 2015 and the KITS-Kadence Advance Traffic Management System was approved as the City's standard for central traffic control software.

The Pan Am phase of the system implementation has been completed. To provide a city wide operation and system it is now necessary to complete the city wide phase of the system implementation. This city wide phase will require a new service agreement with Kimley-Horn & Associates. A city wide maintenance agreement will also need to be completed with Kimley-Horn & Associates.

### **ALTERNATIVES FOR CONSIDERATION**

The Kimley-Horn & Associates KITS-Kadence Advance Traffic Management System was approved as the city's central traffic control software when Council approved Report PW15006 for the Pan Am phase of system deployment. Given the level of investment and resources dedicated to this system there are no other viable options at this time.

### **ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN**

#### **Community Engagement & Participation**

*Hamilton has an open, transparent and accessible approach to City government that engages with and empowers all citizens to be involved in their community.*

#### **Economic Prosperity and Growth**

*Hamilton has a prosperous and diverse local economy where people have opportunities to grow and develop.*

#### **Built Environment and Infrastructure**

*Hamilton is supported by state of the art infrastructure, transportation options, buildings and public spaces that create a dynamic City.*

### **APPENDICES AND SCHEDULES ATTACHED**

None.