

<b>TO:</b>	<b>CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON MAY 28, 2018</b>
<b>FROM:</b>	<b>KELLY SCHERR, P. ENG., MBA, FEC MANAGING DIRECTOR, ENVIRONMENTAL &amp; ENGINEERING SERVICES AND CITY ENGINEER</b>
<b>SUBJECT:</b>	<b>NON-INTRUSIVE VEHICLE DETECTION EQUIPMENT IRREGULAR RESULT</b>

<b>RECOMMENDATION</b>
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That on the recommendation of the Managing Director, Environmental & Engineering Services and City Engineer:

- a) The irregular bid submitted by Fortran Traffic Systems Limited at its tendered price of \$450,765.00 (excluding H.S.T.) **BE ACCEPTED** in accordance with the 'Procurement of Goods and Services Policy' Section 8.10 Irregular Result, Clause b and Section 13.2 Clause b;
- b) the financing for this project **BE APPROVED** with the Sources of Financing Report attached hereto as Appendix A;
- c) the Civic Administration **BE AUTHORIZED** to undertake all the administrative acts that are necessary in connection with this project;
- d) the approval given herein **BE CONDITIONAL** upon the Corporation entering into a formal contract for the material to be supplied and the work to be done relating to this project (T18-55); and,
- e) the Mayor and City Clerk **BE AUTHORIZED** to execute any contract or other documents, as required, to give effect to these recommendations.

<b>2015-19 STRATEGIC PLAN</b>
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The following report supports the Strategic Plan through the strategic focus area of **Building a Sustainable City** by improving mobility for motorists and cyclists at signalized intersections.

<b>BACKGROUND</b>
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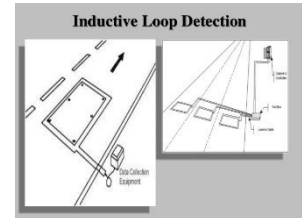
There are 359 traffic signals and 39 intersection pedestrian signals (IPS) in the city. Most intersections are semi-actuated which means the signal will remain green on the main street until a vehicle or pedestrian is detected on the side street. Traditionally, induction loops were used to detect when a vehicle is present on the side street. New detection methods have been developed by the industry to address some of the inherent problems with induction loops. The following report reviews some of these detection methods and recommends a plan to improve vehicle detection.

## DISCUSSION

The following are the various vehicle detection methods that have been tested in the city:

### 1. Induction Loops

These create an electrical circuit in the road that is interrupted when a vehicle passes over or stops on the loop. The metal content of the vehicle varies and can impact the effectiveness of induction loops. Motorcycles and bicycles may not have enough metal to trigger detection. Induction loops are also susceptible to failure as the pavement deteriorates which results in false detection calls. False detection result in increased red signals on the main street which increases driver frustration. It should also be noted that induction loops cannot be repaired during the winter months.



### 2. Video Detection Systems

Stationary cameras are used to track the movement of vehicles in virtual detection zones. Video detection is not dependent on the metal content of the vehicle; therefore, motorcycle and bicycle detection is improved. That said, video detection can place false calls due to weather issues (e.g. sun glare, dark wet pavement, heavy rain, snow, etc.). It should be noted that video detection systems do not record any images.



### 3. LiDAR

LiDAR uses pulsed lasers to measure the distance between the unit and pavement. A vehicle is detected when the measured distance is less than the calibrated distance. This is relatively new technology for traffic detection and London's experience was not positive primarily due to detection distance limitations. All of London's LiDAR units have been removed.

### 4. Magnetometers

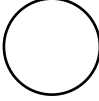

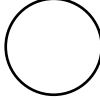
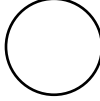

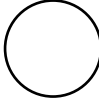

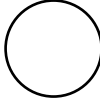



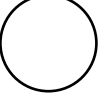
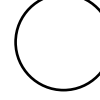


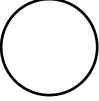









Magnetometer are embedded in the road and use the metal content of vehicle similar to induction loops. This equipment has similar restrictions as induction loops due to the low metal content of motorcycles and bicycles. Repair of magnetometers cannot be done during the winter.


### 5. Radar

Radar units operate similar to video by detecting the travel of vehicles within a virtual zone. Radar is less susceptible to weather interference. Radar also has the added benefit of counting vehicles without any additional equipment. This has been used to increase the number of permanent count stations across the city.



The following table summarizes the above information:

	Induction Loops	Video	LIDAR	Magnetometers	Radar
Motorcycle & Bicycle Detection					
Reliability					
Weather Impacts					
Maintenance					
Cost					

Scoring:  Poor  Better  Best

Radar vehicle detection is superior to the other forms of detection. Wavetronix radar units have been used on a number of projects and they have been performing well. It is recommended that Wavetronix radar units be the standard for actuated traffic signals. That said, new technology will be reviewed for potential use as it is developed.

## EQUIPMENT PROCUREMENT

The tender for the purchase of 25 Wavetronix radar units with four one-year renewals was issued March 28<sup>th</sup>, 2018 and closed April 27<sup>th</sup>, 2018. There was only one bid taker and one bid submission. Other Canadian suppliers of this equipment were contacted to ensure they were aware of the tender.

After consultation with the Manager of Purchasing and Supply, the decision was made to open the sole bid. It is recommended that the contract be awarded to Fortran Traffic Systems Limited as an irregular result in accordance with Section 8.10 (b) of the Procurement of Goods and Services Policy. The bid submitted by Fortran Traffic Systems Limited is within the budget for the purchase of Wavetronix Vehicle Detection Systems.

**CONCLUSION**

A review of the various vehicle detection technologies concluded that radar offers the most reliable detection of all road users given London's climate and the state of the current technologies available. The existing Wavetronix radar units have been performing well.

In order to realize the financial benefits of large purchases, a tender was issued for the purchase of Wavetronix radar units with four one-year contract renewals. It is recommended that the single bid submitted by Fortran Traffic Systems Limited be accepted; noting that it is within the approved Capital budget. These units will be used on a variety of capital improvement projects and reduce the cost of these projects when compared to purchasing the units on a per project basis.

<b>PREPARED BY:</b>	<b>REVIEWED &amp; CONCURRED BY:</b>
<b>SHANE MAGUIRE, P. ENG. DIVISION MANAGER, ROADWAY LIGHTING &amp; TRAFFIC CONTROL</b>	<b>EDWARD SOLDO, P.ENG. DIRECTOR, ROADS AND TRANSPORTATION</b>
<b>RECOMMENDED BY:</b>	<b>RECOMMENDED BY:</b>
<b>IAN COLLINS, CPA, CMA DIRECTOR, FINANCIAL SERVICES</b>	<b>KELLY SCHERR, P.ENG., MBA, FEC MANAGING DIRECTOR, ENVIRONMENTAL &amp; ENGINEERING SERVICES AND CITY ENGINEER</b>

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May 8, 2018/sm

Attn: Appendix A – Source of Financing

cc. Purchasing & Supply Division  
Fortran Traffic Systems Limited, 470 Midwest Road, Toronto, ON M1P 4Y5