



**CITY OF HAMILTON**  
**City Manager's Office**  
**Audit Services**

<b>TO:</b>	Chair and Members Audit, Finance and Administration Committee
<b>COMMITTEE DATE:</b>	June 9, 2014
<b>SUBJECT/REPORT NO:</b>	Performance Audit Report 2013-19 - GPS/AVL Systems Performance Review (Value for Money) (AUD14016) (City Wide)
<b>WARD(S) AFFECTED:</b>	City Wide
<b>PREPARED BY:</b>	Ann Pekaruk 905-546-2424 x4469
<b>SUBMITTED BY:</b>	Ann Pekaruk Director, Audit Services City Manager's Office
<b>SIGNATURE:</b>	

**RECOMMENDATION**

- (a) That the Performance Audit Report 2013-19, respecting the Global Positioning System / Automatic Vehicle Location, attached as Appendix "A" to Report AUD14016, be approved;
- (b) That the General Managers of the Planning & Economic Development, Public Works and Corporate Services Departments be directed to provide the Director of Audit Services with the appropriate management action plans to implement the recommendations as outlined in the attached Appendix "A" to Report AUD14016, by August 31, 2014; and,
- (c) That the Director of Audit Services be directed to provide to the Audit, Finance and Administration Committee by the 2014 calendar year end an information report detailing these action plans.

**EXECUTIVE SUMMARY**

The 2013 Performance Audit work plan approved by Council included a project to compare GPS data to documented work assignments in order to identify areas where productivity and efficiencies may be gained. The review included areas with 15 or more GPS/AVL units – Roads and Water (Public Works) and Building and Municipal Law Enforcement (Planning and Economic Development) – but excluding Transit and EMS. In addition to reviewing processes involved in scheduling or providing work assignments to the staff and matching the vehicle route to the tasks indicated as completed, the capabilities of the GPS/AVL systems used in the City were assessed. Several recommendations were made to address shortcomings in the effective use of the

current GPS/AVL systems and to identify additional opportunities to improve the systems to manage staff and their activities.

The results of this project are presented in a formal Performance Audit Report (2013-19) containing findings, analysis and recommendations. Audit Report 2013-19 is attached as Appendix "A" to Report AUD14016.

***Alternatives for Consideration – See Page 4***

**FINANCIAL – STAFFING – LEGAL IMPLICATIONS (for recommendation(s) only)**

Financial: As the City proceeds to replace the Trackforce system due to its "end of life", funding will be required to cover the related expenditures. As the replacement project is only in its very early stages, the cost is not yet known.

Measures taken to address idling may result in savings in fuel estimated up to approximately \$65,000 annually.

Staffing: One of the potential benefits of a fully functional GPS/AVL system is improved worker productivity and accountability as well as management oversight.

Legal: An effective GPS/AVL system can be used to provide supporting information and documentation for challenging legal claims.

**HISTORICAL BACKGROUND (Chronology of events)**

A motion passed by the Audit, Finance and Administration Committee on March 25, 2013 directed the 2013 Internal Audit Work Plan to be revised to include GPS audits of randomly selected divisions where City vehicles had been retrofitted with a GPS system.

As a result, this project was scheduled as part of the 2013 Performance Audit Work Plan approved by Council. The fieldwork was completed in December 2013. The results of the review are attached as Appendix "A" of Report AUD14016.

The Audit, Finance and Administration Committee receives and approves performance audit reports as part of its responsibilities for the oversight of governance.

**POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS**

None.

## **RELEVANT CONSULTATION**

The recommendations contained in Appendix “A” attached to Report AUD14016 have been communicated to the various stakeholders as indicated after each recommendation – Public Works for Roads and Water and Planning and Economic Development for Building and Municipal Law Enforcement.

## **ANALYSIS AND RATIONALE FOR RECOMMENDATION (Include Performance Measurement/Benchmarking Data if applicable)**

GPS/AVL units are used to automatically determine and transmit the geographic locations of vehicles. The resulting data, from one or more vehicles may then be collected by a vehicle tracking system (i.e. Trapeze, Interfleet or Trackforce) to present a picture of vehicle travel. Since the introduction of GPS technology into City vehicles, close to \$1.5 million has been spent for the Interfleet and Trackforce tracking systems. Annual maintenance and connectivity costs run close to \$200,000 annually.

There are 565 GPS/AVL units installed in City vehicles used by various divisions and sections. Roads (177), Building (35), Water (16) and Municipal Law Enforcement (29) were selected as areas for sample testing.

In the determination of whether GPS data collected supported the documented work assignments and their completion, the data generally aligned with the locations where staff had been assigned or had indicated work had been completed (in Hansen or AMANDA). However, in several sampled instances, the hours of actual equipment movement (use) as per the tracking records did not account for the equipment and labour hours booked to activities.

In order to identify opportunities to better utilize the GPS/AVL systems, a number of operational practices need to be addressed to improve the usefulness of the GPA/AVL systems and related data in managing staff productivity and efficiency. Some of the issues identified include the development and writing of standard recording and record management procedures; the maintenance of supporting documentation such as work schedules, daily activity reports and work completion locations and times (where applicable); accurate records of vehicle assignments; and timely entry of work activities completed in systems such as AMANDA and Hansen.

One of the capabilities of the current Interfleet system allows for the tracking of vehicle idling time. With the sample of idling times as a percentage of the total shift times ranging from 13% to 36%, there is an opportunity to monitor and address needless idling to save fuel costs and vehicle “wear and tear” and gauge productivity of staff.

As the Trackforce tracking system approaches its end of life and the AVL Initiative Committee seeks a suitable replacement, it is the opportune time to consider improved capabilities. These include tracking idling times in all units; utilizing telemetrics to monitor status of equipment (e.g. plow up/down) or measurement of quantities (e.g. salt); providing streetview maps for visualization of vehicles’ travel paths; and

considering Geofence functions for alerting when travel occurs outside an assigned area.

A fully functional GPS/AVL system provides a number of benefits such as the ability to monitor staff work activities and productivity, improved management oversight and accountability capabilities, firm support to challenge legal claims against the City, where applicable and potential integration with scheduling to identify the most effective route selections. However, it is Audit Services' opinion that the use of the current City's GPS/AVL systems (Interfleet and Trackforce) as such tools is neither effective nor efficient.

Audit Services conducted this review in conformity with the *International Standards for the Professional Practice of Internal Auditing*. These standards require that Audit Services plan and perform the review to obtain sufficient, appropriate evidence to support the findings and conclusions based on the review objectives. Audit Services believes that the work performed provides a reasonable basis for the findings and conclusions.

## **ALTERNATIVES FOR CONSIDERATION**

**(Include Financial, Staffing, Legal and Policy Implications and Pros and Cons for each alternative)**

Committee and Council may choose to discontinue the use of GPS/AVL systems and forego any potential benefits. This is not recommended due to the costs already expended to set up the systems and Council's recent approval to equip more City vehicles with the GPS/AVL units for work activity monitoring and resulting productivity improvements.

## **ALIGNMENT TO THE 2012 – 2015 STRATEGIC PLAN**

### **Strategic Priority #2**

Valued & Sustainable Services

*WE deliver high quality services that meet citizen needs and expectations, in a cost effective and responsible manner.*

### **Strategic Objective**

- 2.1 Implement processes to improve services, leverage technology and validate cost effectiveness and efficiencies across the Corporation.

**Strategic Priority #3**

Leadership & Governance

*WE work together to ensure we are a government that is respectful towards each other and that the community has confidence and trust in.*

**Strategic Objective**

3.4 Enhance opportunities for administrative and operational efficiencies.

**APPENDICES AND SCHEDULES ATTACHED**

Appendix "A" to Report AUD14016.

ap:jg