PROJECT REPORT

Automatic Vehicle Location (AVL) System

RECOMMENDATIONS

1. Funding associated with the Automatic Vehicle Location System - Phase 1 be will be charged through Public Works and Water & Waste existing accounts for the trial and test of short listed suppliers.
2. The Automatic Vehicle Location System - Phase 2 will be acquired by the Winnipeg Fleet Management Agency in collaboration with the Public Works Department, Corporate Support Services Department, Water and Waste Department, and Winnipeg Fire Paramedic Service Department, for the fleet-wide implementation of the selected system.

REASON FOR THE REPORT

The City of Winnipeg, through a joint effort between the Winnipeg Fleet Management Agency (WFMA), Public Works (PW), Water and Waste (WW), Winnipeg Fire and Paramedic Services (WFPS) and Corporate Support Services (CSS) is pursuing the deployment of an Automatic Vehicle Location system to allow participating departments to better manage their resources and improve on operation efficiencies.

The purpose of the system is to better manage the utilization and resources of each vehicle for increased efficiency through user definable reporting and feedback from the system. The system has a data reporting rate ranging from real-time to once per day or upon the occurrence of predefined events. The system will be able to interface with vehicle mounted controllers to derive information such as material being used, dry material application rate, wet material application rate, spinner mode, pause status, blast status, error event status, controller status, etc.

This project will be launched in two phases; Phase1 is the trial and testing of systems from short listed vendors. The trial duration is estimated to be between 3 to 6 months with up to 20 vehicles from each participating department. Phase 2 of the project will be the installation and deployment of the most advantageous Automatic Vehicle Location system awarded from Phase 1 into all appropriate Winnipeg Fleet Management Agency vehicles.

Currently, a review and evaluation of proposals from 13 bidders received from Bid-Opportunity 945-2012 is underway.

IMPLICATIONS OF THE RECOMMENDATIONS

<u>Phase 1: Trial & Test</u>

It is intended that 4 to 5 vendors will be selected for this phase of the project. Each vendor is to supply 20 Automatic Vehicle Location units for the trial. The trial will be monitored by Winnipeg Fleet

Management Agency (WFMA), Public Works (PW), Water and Waste (WW), Winnipeg Fire and Paramedic Services (WFPS) and Corporate Support Services (CSS). The trial duration is estimated to be between 3 to 6 months. This will allow capturing of data over various weather conditions as well as a variety of equipment usage. The procurement and installation costs for Phase 1 will be funded by Public Works and Water & Waste departments.

Phase 1: Financial

The estimated cost provided by Corporate Support Services for Phase 1 – Trial & Test of the Automatic Vehicle Location System is based on 4 to 5 short listed vendors:

- $100,000.00 (includes hardware, software, installation & removal)
- To be funded by Public Work's and Water & Waste existing accounts

Phase 2: Implementation

It is intended that after the completion of Phase 1 and upon evaluation, the City will determine the system that best meets its needs and will award the contract based on the results. This phase of the project will be the deployment and installation of the selected Automatic Vehicle Location system into all appropriate Winnipeg Fleet Management Agency vehicles. The implementation campaign is estimated to take place over a 2 year period with a total of approximately 1800 vehicles.

Phase 2: Financial

The estimated Capital cost of $1.5M for Phase 2 implementation will be funded through Winnipeg Fleet Management Agency for purchase and installation on approximately 1800 vehicles. The approximate cost of $1.5M is based on evaluation of bids received through Bid Opportunity 945-2012 and an accurate dollar amount will not be known until the Automatic Vehicle Location system that best meets the City of Winnipeg's needs is awarded at the end of the Trial & Testing phase. The Winnipeg Fleet Management Agency will charge back the purchase cost and installation cost to the departments participating in the Automatic Vehicle Location project. Department specific monitoring costs of the Automatic Vehicle Location system will be the responsibility of each individual department.

HISTORY

1. Green Fleet Plan:

On July 21, 2010 (minute No. 572**)** City Council approved a Green Fleet Plan aimed at reducing fleet related greenhouse gas emissions by 17.65% from 1998 levels by 2019. This reduction in the corporate vehicle fleet emissions is estimated to result in a 4.87% reduction in the City's overall corporate greenhouse gas inventory.

With the adoption of an Automatic Vehicle Location system, the Winnipeg Fleet Management Agency will be able to implement item #5 a) of the City of Winnipeg's Green Fleet Plan by enforcing, through a joint effort with the departments, an idle reduction policy that limits the amount of time a City vehicle or piece of equipment can idle, with an aim to reduce fleet idling by 50% by 2019. It is anticipated that with the idle reduction policy that the City will be able to achieve annual fuel savings of 3% and reduce the City's greenhouse gas emissions by 2,205 tonnes per year by 2017.

Currently the Winnipeg Fleet Management Agency does not have a means of monitoring engine idle time within the City's fleet. It is anticipated that engine idle time accounts for 30% of the City's annual fuel use, and offers the largest potential area for savings. The Automatic Vehicle Location system will allow the collection of data that will be used to identify idling time.

2. Standardization:

Within the City there are various Global Positioning System/ Automatic Vehicle Location systems that are in place departmentally, with varying degrees of success. With the trial, testing and subsequent installation of a new Automatic Vehicle Location system, a potential exists to have one standardized system. By adopting one standard it allows for more efficient use of resources and reduced cost to the City. In addition, if other departments decide to implement Automatic Vehicle Location units in the future, the installation and maintenance processes can be completed with minimal difficulties. Other benefits would be reduced spare parts, stocking resources, training and maintenance costs with a standard system.

3. Utilization Plan:

The Winnipeg Fleet Management Agency will be utilizing the data collected by the Automatic Vehicle Location system in order to monitor unit idle information, engine meter readings, and unit down time at maintenance facilities. The future goal will be to use this information to improve the preventative maintenance schedules of units as accurate meter information will be received. The Winnipeg Fleet Management Agency will also explore an optional feature that allows the Automatic Vehicle Location system to connect with on-board vehicle diagnostic equipment to assist in troubleshooting, repair and maintenance of vehicles. The system also provides a means for asset based tracking and locating of equipment to aid in loss prevention of City equipment.

Public Works and Water & Waste will be the largest users of the Automatic Vehicle Location system and will use it to improve route mapping, incident reporting when auxiliary equipment is used such as sander spreaders, insecticide sprayers and unit tracking for water main breaks etc. In addition the Automatic Vehicle Location system through onboard telemetry will enhance accident reporting and will be able to alert monitoring staff of emergency situations such as in case of a vehicle accident, where the driver can be contacted and emergency crews can be dispatched to the exact location. These features will also enhance driver/operator safety during work-alone activities and provide for improved asset management.

Winnipeg Fire Paramedic Service will use the near real time Global Positioning System functionality of the system to improve response times by dispatching the nearest available vehicle to the scene. While future potential benefits of the system would be through synchronizing the Automatic Vehicle Location system with emergency response units to traffic light systems that would allow for "always green" traffic lights which would further improve response times.

4. Benefits / System Features:

Currently, there are numerous Automatic Vehicle Location systems in use by other public and private agencies. Most have reported positive improvements to operational efficiencies and enhanced resource management. With the implementation of an Automatic Vehicle Location system within the City's fleet, the City may also see similar benefits.

Some of these have been noted above. Other benefits and features of the system include:

- Near real time vehicle data on:
    - Geographical location
    - Vehicle speed & direction of movement
    - Engine status (start / on / off)
    - Monitored sensor status (plow up/down, sweeper broom on/off, etc)
- Ability to identify the vehicle and operator of the vehicle through an optional "Driver Identification" Module.
- Graphical display of vehicle location on a map with the ability to "zoom in & out" to identify the closest vehicle response team.
- User defined alerts/reports on vehicles exceeding speed limits, hard starts/stops.
- Predefined boundaries or "geozones" and collection of data reporting on vehicle entering, exiting, time within zones.
- Mobile device connectivity to the Automatic Vehicle Location system monitoring software.
- Vehicle data can be utilized for timely response to emergencies.
- Improved resource management by analyzing past activities to increase efficiency.
- Reduced time associated with route planning thereby reducing fuel usage and idling during travel.
- A potential exists to provide near real time information to 311 or on the City website of City equipment performing insect control, traffic equipment repairs, water-main repairs.

5. Operational Savings (including safety benefits):

More tangible benefits of the Automatic Vehicle Location system and its ability to provide vehicle and equipment data can be realized during fleet operations. The data collected by the system can be analyzed to determine the best approach in summer and winter deployment of resources. These include:

- Reduced material costs with more efficient application strategies regarding salt and sand in winter months.
- Lower fuel and maintenance costs by deploying the most appropriate equipment for weather conditions, road conditions or site requirements.
- More accurate reporting of fuel usage, distances traveled, odometer and idle time to optimize fleet utilization.

In addition to the operational savings above, a greater benefit of the system will be seen in assisting with driver/operator safety. Some examples of these are:

- Accident reduction due to more efficient snow removal and sanding.
- Faster response to emergencies due to emergency vehicle route planning based on plowed status of roadways.
- Ability to have accurate records and vehicle location history prior to accidents which would be used to assist in accident investigations.
- Potential exists to realize reduced legal costs from claims allegedly involving City vehicles.

6. Support of "Our Winnipeg" Initiatives:

By adopting the Automatic Vehicle Location System, the City will be able to achieve certain milestones in support of sustainability initiatives called for in the "Our Winnipeg" plan. In particular, the Automatic Vehicle Location system would fall under the category of:

a) 01-1b Key Directions For Connecting And Expanding Our Sustainable Transportation And Infrastructure Networks (Pg. 32). Achieving goals related to:

- Create safe, efficient and equitable transportation system for people, goods and services
- Create transportation system that supports active, accessible and healthy lifestyle options
- Provide transportation infrastructure that is well maintained

b) 02-2 Environment (Pg. 68). The Automatic Vehicle Location System will be able to provide data allowing more appropriate processes and/or equipment to be deployed that would help in reducing fuel usage thereby reducing harmful greenhouse gas emissions. In doing so, the City would achieve goals identified as:

- Reduce the environmental impact of our activities, through strategies such as planning for sustainable energy use and greenhouse gas reduction.
  Provide safe and effective pest and weed control in City operations.

CONSULTATION

In preparing this report there was consultation with:

Public Works Department, Information Systems & Technology
Corporate Support Services, Project Management Office
Corporate Support Services, Communication Systems
Water and Waste Department, Information Systems & Technology
Fire Paramedic Service, Information Systems & Technology

SUBMITTED BY

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