



**Request for Bids
Vehicle GPS Equipment
Bid No. B16-011**

Issue Date: August 21, 2015

I. Introduction

The City of Bangor is requesting bids from qualified vendors to furnish and install Vehicle GPS tracking equipment on various vehicles in the City of Bangor fleet for a period of one (1) year. Three (3) additional one (1) year renewal options are contemplated contingent upon mutual agreement of the parties. The products and their delivery shall comply with the specifications contained in this request.

II. General Information

General information is available on the City's website at the following web address: www.bangormaine.gov/proposals. By submitting a response to this solicitation, the bidder accepts the responsibility for downloading, reading and bidding by the terms and conditions set forth in the City's "General Information for Vendors". All questions shall be directed in writing to bids@bangormaine.gov.

III. Submission

To be considered, return Bid Form on page ten (11) of this Request for Bids in an envelope clearly marked "**Bid No.: B16-011: Vehicle GPS Equipment**" by **2:00 PM, Friday, September 11, 2015** to the Purchasing Department, City Hall, 73 Harlow Street, Bangor, Maine 04401.

Bids may also be submitted via email by using the link at the top of this page or by sending to: bids@bangormaine.gov. If emailing bid, please reference "**Bid No.: B16-011: Vehicle GPS Equipment**" in the subject line. Bids will be publicly opened at the time stated above.

A tabulation of all bids received will be available after 3:00 PM on the date of opening. Bid results may be viewed by visiting the City's website at www.bangormaine.gov/bidtabs.

IV. Questions

All questions must be directed in writing to bids@bangormaine.gov no later than **4:30 PM, Wednesday, September 2, 2015**.

The City will issue a response to any questions or inquiries submitted in writing by the date above, on or before **4:30 PM, Friday, September 4, 2015**. The response will be in the form of an addendum, which will be available on the City's website.

V. Award

The bid award will be based on the following:

- Price offered.
- Quality of service.
- Availability.
- Prior history or experience with the Bidder (if no history or experience, references will be requested).

VI. Prices

The bid prices must be those figures listed on the Bid Form and remain firm for the first year of the contract. Future price adjustments may be granted with 30 days written notice to the City by the contractor.

VII. Estimated Annual Requirements

This solicitation covers per unit cost and monthly charges only and is not a commitment to purchase.

VIII. Delivery of Services

Initial purchase of GPS Units ordered by the City of Bangor shall be invoiced on or after the first of the month following the month of installation. Thereafter the vender shall send monthly invoices for monthly charges on or after the first day of the month for services rendered the month before. Initial units shall be operational including all training by October 16, 2015, earlier installation and training is preferred.

IX. Term of Agreement

The contract shall be effective upon execution and continue through September 30, 2016. The option to renew for three (3) additional one (1) year periods is contemplated contingent upon mutual agreement of both parties. The contract may be terminated without penalty upon a thirty (30) day written notice by either party(s).

X. Definitions

1. AVL Automatic Vehicle Location Unit
2. Advanced AVL For vehicles with salt/sand, liquid deicing, plowing & dump
3. Basic AVL For vehicles such as sweepers and catch basin cleaners
4. Regular AVL For vehicles with plows and dump bodies
5. Light AVI For vehicle location tracking
6. Portable AVL Cigarette lighter plug in units

XI. Specifications

1. General Requirements	
1.1	The system must operate in field conditions experienced in the daily operation of all fleet vehicles & equipment involved in the City of Bangor's winter maintenance operation. The types of vehicles to be supplied with Automatic Vehicle Location (AVL) units are snow plows, salt and sand spreaders, liquid deicing and anti-icing materials, sidewalk plows, patrol vehicles, and service vehicles.
1.2	The AVL control unit shall be mounted securely inside the vehicle's cab and must operate on vehicle electric power (12V or 24V).
1.3	The antenna must be suitable for all equipment mounting (i.e. permanent or magnetic mount) and a suitable cable in varying lengths must be provided.
1.4	The system shall be able to interface to on-board discrete sensor inputs and 3 rd party data logging systems (i.e. spreader controller consoles) simultaneously.
1.5	The system shall be able to interface to existing salt spreader control systems including Bosch Rexroth CompuSpread 230, 440 & 550, Cirrus. The City of Bangor currently has 2 Cirrus, 3 Bosch Rexroth 440 and 5 Bosch Rexroth 550 units.
1.6	The overall system shall be capable of tracking, storing and reporting the movements and actions of a fleet of various vehicle types in real-time. Collection of data shall include all GPS and Telematic Data being collected by the AVL unit.
1.7	Data transmission rates shall be configurable. Some fleets will require real-time reporting (every 5 seconds, 10 seconds, 30 seconds, 1 minute) while others will require less frequent updates (3 minutes, 5 minutes). System should have the ability to report on event changes and distance or a combination thereof.
1.8	Event reporting must include turn by turn reporting (i.e. 15 degree change in directional heading causes GPS data to be sent this allows corners of intersections, ramps, and other critical infrastructure to ensure there is coverage).
1.9	Positional accuracy shall be sub 2.5 meters.
1.10	The GPS receiver must be able to track coarse acquisition code and link one frequency on at least 16 parallel continuous tracking channels with an update rate to be once per second
1.11	Time to first fix shall be 35 seconds for a cold start and warm start and 1 second for a hot start for reacquisition after losing signal
1.12	The software as a service solution must have an up time of minimum 99.5%.
1.13	The system must be compatible with the City of Bangor's browser environment.
1.14	The system must be a software as a service platform to allow for future enhancements to be deployed and configured into the system with ease. Must allow for this continuous expansion and scalability.
1.15	The system must be scalable to allow for the addition of partial or full City of Bangor fleet and allow for the management of the full fleet in a single view of the software.

1.16	The system must be accessible from a variety of desktop browsers and mobile devices.
1.17	The system must have a desktop computer version of the software and a mobile version for apple and android devices.
1.18	System uptime outside of designated maintenance window hours must be within 99.5%.

2. Configuration/Administration/Security Requirements	
2.1	System access must require user authentication of username and password.
2.2	The user interface shall present vehicles and permissions provisioned according to the user logged in.
2.3	The system must support multiple authorizations simultaneously from multiple locations.
2.4	Each vehicle on the map should have a unique identifier as determined by the City of Bangor.
2.5	User privileges shall be based on assigned username and password. System shall allow modification of the number of vehicles to be monitored, sensors to be monitored and monitor characteristics. User access levels shall be configurable for type of user (i.e. administrator, management, customer service/dispatch).
2.6	All data collected and data transferred shall be secured from unauthorized access.
2.7	The list of authorized users shall be determined by the City of Bangor.
2.8	System must support provisioning of multiple users and groups of users.
2.9	The system must provide an option for secure socket layer authentication (SSL/HTTPS).

3. Hardware/Firmware Requirements	
3.1	The vendor must offer a wide variety of AVL units to meet the needs for simple tracking through to complex on-board system integrations (i.e. spreader controllers) in order to accommodate the various business requirements for the wide range of vehicles in the City of Bangor fleet. The types of desired units are listed below.
3.1.1	<i>Asset Tracking AVL Unit:</i> Providing one to two location transmissions per day to locate field assets such as portable message signs, generators, and other type of equipment left outside of equipment facilities.
3.1.2	<i>Portable Tracking AVL Unit:</i> Track and trace unit which is used for tracking temporary vehicles or fleets which are frequently rolling over, such as contractors, spare vehicles infrequently used, etc.
3.1.3	<i>Light Vehicle Plug n' Play AVL Unit:</i> Plug n' play device which connects directly to the OBDII port of light duty vehicles providing location along with engine data available from the vehicle.
3.1.4	<i>Basic Automatic Vehicle Location (AVL) Control Unit:</i> Unit to connect with the vehicle engine as well as providing a minimum of two (2) inputs.
3.1.5	<i>Advanced AVL Control Unit (with on-board systems integration functionality):</i> AVL unit must at a minimum be able to interface to fourteen (14) digital sensor inputs, four (4) analog to digital input, four (4) dedicated outputs, two (2) RS232 communication Ports, two (2) USB Ports, and an Ethernet port.
3.2	Advanced AVL unit must be equipped with an on-board Operating System with a Web Server Platform, hard drive shall support a minimum 2GB storage.
3.3	AVL units will be capable of remote, over the air configuration.

3.4	Vehicle remote configuration must be web browser based, capable of logging into the AVL control unit to: <ul style="list-style-type: none"> • Set distance and time reporting intervals • Set destinations for data communications • Sensor status changes and expansion of devices • Updating or changing the AVL unit's firmware.
3.5	Firmware must be remotely upgradeable via wireless interface from a central location requiring no intervention from the City of Bangor other than having the AVL unit turned on.
3.6	Firmware has reporting capability on degrees (bearings): meaning the reporting frequency can be every 100 meters, 5 seconds, and 15 degrees of bearing change. This allows for areas such as on and off ramps, intersections, and short street segments to have coverage.
3.7	Advanced AVL unit must be equipped with USB input and host connectivity to any on-board USB device.
3.8	Must be able to operate on both CDMA/1XRTT, EVDO and GSM/GPRS, HSDPA/3G cell networks, as well as satellite based networks.
3.9	GPS and telematics data shall be stored on-board the AVL control unit when cellular signal is weak or lost and sent when the cellular connection is regained.

4. Live Data Requirements	
4.1	The software system must be capable of showing vehicles in motion leaving tracks or "breadcrumbs" as it travels with arrow indicators for direction and showing all operations (GPS & Telematics data) as they occur. Users shall be able to view the above mentioned data for their entire fleet or select a specific vehicle(s) for a login session using a Filter Tool.
4.2	The system must have the ability to indicate when the vehicle is not in motion for a length of period.
4.3	System shall have real time exception reporting capabilities to immediately send exception parameters (such as speeding, idle, geo-fence violation, etc.) when triggered to an email, cell phone, and pagers.

5. Telematics Requirements	
5.1	Each data packet (report) from the AVL unit shall at a minimum contain all GPS data and telematics data captured from the vehicle.
5.2	The equipment must be able to send the collected data automatically to a data warehouse system hosted by the Successful bidder.
5.3	Where multiple equipment and/or wireless data networks are available, the vendor shall choose the equipment and/or network that will supply the highest reporting interval between transmissions sent from the on-board equipment to the database system at equal costs to the City of Bangor. The City of Bangor shall have the option to leverage its existing contract with its wireless carrier.
5.4	The system must allow for additional integration capabilities to on-board discrete sensory interfaces and 3 rd party data logging system through RS232, USB, and/or RJ45 port connections.
5.5	Additional discrete sensor integrations shall include, but not be limited to: <ul style="list-style-type: none"> • Blade & Wing Up/Down; • Plow Up/Down; • Spreader On/Off; • Lights On/Off; • Box Up/Down; • PTO Sensors; and • In-Vehicle and Remote Panic Buttons.

5.6	<p>In addition to the list of existing salt spreader control systems listed in item 1.6 (CS 230/440/550, Cirrus, Force America), the system shall also be able to integrate to other salt spread control systems such as:</p> <ul style="list-style-type: none"> • Dickey John • Component Tech (GL-400, ACS) • Schmidt-Stratos • Accucast • ACE <p>For all salt spreader controllers, the data should be collected, stored and reported whenever a change to any of the following fields occurs: solid material type (eg salt/sand), solid material spread rate, solid material spread width, gate setting, blast on/off, pause on/off, liquid material spread rate, prewet on/off, and error status – depending on the availability for the particular spreader controller.</p>
5.7	<p>The system shall be capable of interfacing to the vehicle's on-board computer to collect the engine data which is available via OBDII and the SAE standard J1708/1587, CANBUS, and J1939 networks. If Engine Hours and Odometer values are unavailable from the vehicle's on-board computer the system must be able to calculate virtual Odometer and Engine Hours based on the reporting of the vehicle and GPS distance. It is understood there may be variability in engine data between different makes and models of vehicles.</p>

6. Vehicle Data Requirements	
6.1	<p>The information from the equipment to the database shall include the following real time as well as recorded historical information, a) Vehicle speed, direction and location, b) Engine on or off, c) Engine idling vs. running time comparisons, d) Time and distance by each monitored sensor, e) Stop time data.</p>
6.2	<p>The salt spreader information shall include: Material being used, Dry material application rate, Wet material application rate, the equivalent of a pause status (if available), event type (over speed, exceptions), error event status (if available). The system will provide real time spread rates and other information based on information received from the vehicle's spreader control system. The unit shall interface to sensors on the spreader units to determine the status of material spreading.</p>
6.3	<p>Vendor must be able to provide data from all salt spreader controllers into one report. Users shall be able to select all, multiple, or individual vehicles and date(s) and timeframe for each report. Report shall output at a minimum vehicle ID, date/time, vehicle spreading time/distance, deadheading time/distance, vehicle total travel time/distance, dry material usage, liquid material usage, avg. application rate.</p>
6.4	<p>The vendor shall provide, install and maintain sensors in good working order to monitor the status.</p>
6.5	<p>The AVL unit must be able to communicate with equipment sensors installed on the vehicle to report their present status and changes to their status in real-time. The sensors, such as proximity switches, infrared, magnetic read switches, micro limit switches or equivalent must be able to communicate their status to the equipment with necessary cabling connected to onboard equipment when required.</p>

7. User Interface Requirements	
7.1	<p>Users shall be able to view the position of their fleet vehicles at any point of time via a standard web browser desktop computer. The primary display shall be a map view of fleet vehicles and indicate the status of vehicles on when it last reported.</p>
7.2	<p>The System shall have the capability to enter an address or select a landmark to display at a minimum the 5 closest vehicles to that location including vehicle ID & distance to the specified location.</p>

7.3	The map display shall be such that vehicle position and status automatically update on screen without any input from the end-user, additionally, end-users shall be able to view the status of monitored on-board vehicle equipment with each fix or report.
7.4	The system must have an easy 'intuitive' navigation sequence (i.e. navigator bar and/or tabs for easy access to various functional screens). Tools shall include but not be limited to: <ul style="list-style-type: none"> • Map navigational tools (zoom in/out, center, pan, etc.); • Breadcrumbs; • Filter Tool; • Historical Data; and • Reports.
7.5	User interface shall utilize point and click features as much as possible to increase ease of use and limit input user error
7.6	User shall have options to select from different map views of the map in order to accommodate varying business requirements, desktop equipment performance and Internet connectivity.
7.7	Upon vehicle ignition, the vehicle will automatically report to the system. No operator interface will be necessary to begin transmitting position and sensor data. All information on vehicle status shall be stored and accessible on through an online database

8. Mapping Requirements

8.1	The mapping display shall be Open GIS based and be able to integrate with any static internal GIS databases, external dynamic GIS databases, or third party GIS data sources.
8.2	The system must be able to connect directly to publish map services from the City of Bangor Esri GIS environment.
8.3	The system must be able to incorporate the City of Bangor's GIS data as the mapping interface as well as to be the primary source for geospatial reporting tools.
8.4	State (if any) the specific requirements and/or modifications to the City of Bangor's GIS data that needs to be done for the implementation. This can include, but is not limited to: <ul style="list-style-type: none"> • Map layers needed for display (e.g. roads, parks, watercourses); • Additional required fields in the GIS attribute table (e.g. route number); and • Special requests (e.g. line segmentation).
8.5	User shall be able to toggle back and forth between mapping interface and other features without having to close screens.
8.6	The system must have the capability to create, edit, and delete Landmarks/geo-fences and be displayed on the map. In addition the Landmarks shall be identified in the reports.
8.7	The system must present the option to view Google Maps, City of Bangor provided maps, and third party published mapping (such as weather radar). The system must allow the user to toggle between each of these maps without closing any other functionality in the system.
8.8	The system must have capability to provide live service level mapping. This functionality must show roads representing different colors associated with service level. For example green is serviced within the last two hours, yellow between two and four hours, red between four and eight hours, etc. This feature must be made available as an overlay onto any of the combinations of mapping (google, Esri, other); which updates in near real-time.

9. Reporting Requirements

9.1	AVL data shall be accessible on-line for a period of up to 15 months. Data beyond the 15 month period shall be reinstated online and available to the users upon request by the City of Bangor Data shall be archived indefinitely.
9.2	The system shall provide easy to use reporting tools to provide outputs of all telematics data. Reports should have the option of exporting to Excel, PDF, HTML, or other applications.
9.3	The system shall be able to generate summary reports based on data supplied and user's input.

9.4	Reports should be based on a single or group of vehicles, all vehicles and/or by driver.
9.5	The system shall include a playback feature allowing users to review historical data for selected vehicle(s), date(s) and timeframe. This data shall be output in a spatial-map based and/or tabular report. When reviewing the data graphically, there must be a playback feature allowing the user to plot vehicle history on the map.
9.6	Playback history shall include the ability to leave tracks or “breadcrumbs” depicting progress and direction along a roadway. This function shall enable the user to view data that has been collected from the vehicle (GPS and telematic data).
9.7	Users shall be able to generate standard reports summarizing vehicle activity by selecting the vehicle(s), date, and timeframe. Information shall include but not be limited to: <ul style="list-style-type: none"> • Start/Stop times • Idle times • Distance Traveled (miles) • Hours Traveled • Number of Stops • PTO time usage • Vehicle Status (i.e. stopped, moving, etc.)
9.8	In addition to standard reports, the system must be capable of generating exception reports for parameters such as <ul style="list-style-type: none"> • Speed • Idle time • Zones • Input based exceptions (i.e. Panic buttons, PTO times, etc.)
9.9	The system shall provide a reporting tool to provide vehicle and material information such as date, time started, time completed, total distance traveled, total distance spread, total dead head distance, material usage, application rate, Liquid usage, liquid application rate, and totals of the above information per snow event/storm.
9.10	Route Complete Reporting must be available within the system. This reporting shall provide outputs, both spatial and tabular, to indicate what percentage of roads within a route have been serviced. In addition, there must be parameters available to configure the number of passes and vehicles associated with each pass to consider any route complete. This report must have the capability to be output against any date and time parameter, which is defined by the user.
9.11	The system must include a reporting system to allow users to build their own telemetry reports. This functionality must allow for one or many telemetry inputs to be combined with selectable logic to combine or independently report together in a summary report.

10. Warranty, Maintenance, and Support Services Requirements	
10.1	The Successful Bidder shall be responsible for supplying and installing the AVL system (software and hardware).
10.2	AVL units must be covered by warranty for a minimum of one (1) year from the date of installation, during which period maintenance and support shall be provided. Optional extended warranties must be available.
10.3	There must be a program available whereby the monthly fee covers the warranty of the AVL unit, replacement AVL units, and guarantees protection against any hardware technology obsolescence preventing the AVL unit to operate within the contract term, i.e. 3 years. Optional renewal terms of this program must also be available.
10.4	The Successful Bidder must have the necessary support organization to provide remote diagnostic support and dispatch field services personnel to assist the City of Bangor and on-site maintenance and technical support.

11. Training Services Requirements	
11.1	All training on system functionality, training manuals, and installation of all hardware shall be available from the Vendor and shall be included in the proposal. Initial on-site training for operators, mechanics and administrative staff shall be included in the proposal.
11.2	Training programs must be available with on-site and remote (webinar) sessions. Training sessions shall accommodate up to 15 people per session. Training materials shall be given as hard copy and available electronically.
11.3	The vendor must have a web portal where all training manuals, videos, and information on product is maintained in an easy, self-serve manner for end users.

12. Public Information Systems	
12.1	The vendor must have optional services to publish data to public websites and apps providing detail on the status of agency service level.
12.2	The vendor must host such services as public websites and apps with the ability to build and manage the delivery of the apps within Google Play and the Apple App Store/iTunes
12.3	The public information services publishing data to public websites and apps shall provide location of vehicles, in addition to colored traced routes in the form of map outputs (i.e. heat map, color coded map data, etc.) allowing for at a glance interpretation of how the City of Bangor is performing against their service level.



Bid Form
Vehicle GPS Equipment
Bid No.: B16-011

Bid Deadline:
2:00 PM, Friday
September 11, 2015

Item	Description	Est. Qty.	Unit	Unit Price	Total Price
GPS Equipment Bid					
1	Advanced AVL Units	10	Each	\$	
2	Advanced AVL Units monthly charge	120	Each	\$	
3	Basic AVL Units	3	Each	\$	
4	Basic AVL Units monthly charge	36	Each	\$	
5	Regular AVL Units	1	Each	\$	
6	Regular AVL Units monthly charge	12	Each	\$	
7	Light AVL Units	1	Each	\$	
8	Light AVL Units Monthly charge	12	Each	\$	
9	Portable AVL Units	1	Each	\$	
10	Portable AVL Units monthly charge	12	Each	\$	
11	Additional Training at Public Works facility	1	day	\$	

Total Bid Price _____

Business Name:			
Street or PO Box			
City, State, Zip			
Telephone Number			
Fax Number			
Email Address			
Contact Name			
Title		Date	