



System Assessment and Validation for Emergency Responders (SAVER)

Asset Tracking and Inventory Systems

Market Survey Report

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System Assessment and Validation for Emergency Responders

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FOREWORD

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions. Located within the Science and Technology Directorate (S&T) of DHS, the SAVER Program conducts objective assessments and validations on commercially available equipment and systems, and develops knowledge products that provide relevant equipment information to the emergency responder community. The SAVER Program mission includes:

- Conducting impartial, practitioner-relevant, operationally oriented assessments and validations of emergency response equipment
- Providing information, in the form of knowledge products, that enables decision-makers and responders to better select, procure, use, and maintain emergency response equipment.

SAVER Program knowledge products provide information on equipment that falls under the categories listed in the DHS Authorized Equipment List (AEL), focusing primarily on two main questions for the responder community: “What equipment is available?” and “How does it perform?” These knowledge products are shared nationally with the responder community, providing a life- and cost-saving asset to DHS, as well as to Federal, state, and local responders.

The SAVER Program is managed and executed by the National Urban Security Technology Laboratory (NUSTL). NUSTL is responsible for all SAVER activities, including selecting and prioritizing program topics, developing SAVER knowledge products, coordinating with other organizations, and ensuring flexibility and responsiveness to first responder requirements. NUSTL provides expertise and analysis on a wide range of key subject areas, including chemical, biological, radiological, nuclear, and explosive weapons detection; emergency response and recovery; and related equipment, instrumentation, and technologies. For this report, NUSTL conducted a market survey of commercially available asset tracking and inventory systems. These fall under AEL reference number 04AP-07-INVN titled Software, Equipment Tracking and Inventory.

For more information on the SAVER Program or to view additional reports on asset tracking and inventory systems or other technologies, visit www.dhs.gov/science-and-technology/saver.

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1. INTRODUCTION

Asset tracking and inventory systems read information from labels or tags affixed to physical assets and help manage information such as item quantities, locations, personnel assignments, and maintenance needs. Emergency response agencies use them to keep track of important items such as firearms, vehicles, evidence, tools, medical kits, and disaster relief supplies. To provide emergency responders with information on asset tracking and inventory systems, the System Assessment and Validation for Emergency Responders (SAVER) Program conducted a market survey.

This market survey report is based on information gathered from February through April, 2016 from vendors, Internet research, and a government issued Request for Information that was posted on the Federal Business Opportunities website. For inclusion in this report, the asset tracking and inventory systems had to meet the following criteria:

- Commercially available software for the tracking and/or inventory of physical assets
- Integrate barcode, radio frequency identification (RFID), and/or global position system (GPS) technologies

Due diligence was performed to develop a report that is representative of products in the marketplace.

2. ASSET TRACKING AND INVENTORY SYSTEMS OVERVIEW

An asset tracking and inventory system consists of software running on computers or mobile devices that communicate and read information from assets that are tagged with one or more location tracking technologies. Assets can include personnel if they are wearing tagged badges or wrist bands. Software can track assets in real time and display their locations on a geographic information system (GIS), update data associated with an asset, and send notifications when an asset needs maintenance, has crossed a geographic boundary, or needs assistance in some way.

2.1 Current Technologies

Asset tracking and inventory systems generally apply one or more of the following technologies to read information tagged to items.

2.1.1 Barcodes

Barcodes are machine-readable identification tags that encode alphanumeric characters. They are typically printed on a label and affixed to an item of property. One dimensional (1-D) barcodes use vertical bars and can store approximately 20 characters. Two dimensional (2-D) barcodes use graphical patterns and can store more than 1,000 characters.

Barcode labels are inexpensive and can be quickly produced with barcode generating software and a printer. Labels are available that are resistant to sunlight, water, chemical solutions, and extreme temperature changes. Information encoded on a barcode label cannot be updated, but a new label can easily be printed. Barcodes can be read by most smartphones or by specialized barcode scanners that connect to a computing device. With a barcode scanner and appropriate

asset tracking and inventory software, a large number of items (tools, evidence, etc.) can be inventoried quickly and inexpensively.

2.1.2 RFID Tags

RFID asset tracking is accomplished through radio frequency (RF) waves transmitted between an RFID property tag and an RFID reader. An RFID tag contains an antenna that receives and transmits RF signals and an integrated circuit that stores and processes data. RFID tags can be either active or passive. An active tag contains an internal battery that allows it to transmit its signal either at regular intervals (beacon tag) or when in range of a powered RFID reader (transponder tag). Active tags are larger and more expensive than passive tags (Figure 3), and have a battery which may have to be replaced after several years. They have a transmission range of up to 300 feet and can store about 32 kilobytes of data. Passive tags do not have an internal power source. Instead, they receive the energy needed to transmit from the RF waves they receive from an RFID reader. The signal from the reader activates the tag and provides enough energy for the tag to transmit data in response. Passive tags are much less expensive than active tags, but have a greatly reduced transmission range of about 10 feet. Both active and passive RFID tags are available in read-only and writeable formats.

RFID systems can be used for asset tracking and inventory in a variety of ways. Since items do not have to be within line of sight of a reader, and multiple items can be scanned sequentially, all tagged items in an enclosed kit can be inventoried quickly without opening the container. RFID readers can be placed at doorways to track equipment movement in and out of an area. Alarms can be configured when an item passes a reader or when an item is no longer within range of a reader. Equipment with writeable RFID tags can contain updated maintenance and calibration data. In addition, RFID tags on badges can be used to authenticate personnel during an emergency response.

2.1.3 GPS Receivers

A GPS receiver that can integrate into an item of equipment can determine the precise location of the item and report its location at regular intervals. GPS receivers determine their latitude and longitude by receiving information from multiple satellites. Passive-tracking GPS systems log data and determine where the system has been once the data has been downloaded and analyzed. Active-tracking GPS systems transmit data wirelessly to a computer that can monitor the present location, direction, and speed of the item. GPS tracking systems are generally used for monitoring vehicles and other large mobile assets.

2.1.4 Other Technologies

Bluetooth Low Energy (BLE), also known as Bluetooth 4.0, is a wireless technology that allows very small devices to transmit data using batteries that may last more than a year. Keys, wallets, and gear in kits and containers can be tagged with BLE tracking devices and linked to a smartphone or to a tracking service hosted by a manufacturer. Using BLE, nearly constant communication can be maintained between the asset and the tracking system, and alerts can be issued by appropriate software if, for instance, the item is separated from the phone or other items.

Ultra-Wideband Radio is another technology that can provide highly accurate location readings from devices with battery-operated sensors and tags.

2.2 Applications

Emergency responders use asset tracking and inventory systems to manage and track personnel, vehicles, evidence, firearms, tools, medical kits, disaster relief supplies, and other types of equipment. Emergency response organizations can track their personnel in real time and locate them during fire and rescue operations. Agency officials can track fleets of vehicles and other mobile assets worldwide. Essential equipment can be inventoried in seconds prior to an emergency response. Almost any item can be tagged for use with asset tracking and inventory systems, and a wide variety of software is available to accommodate user's needs.

2.3 Standards/Regulations

In February 2014, the International Organization for Standardization (ISO) published the ISO-55000 series of standards covering the managing and tracking of physical assets. This series is comprised of the following three standards:

- ISO-55000 provides an overview and defines standard terms
- ISO-55001 specifies requirements for an integrated and effective system
- ISO-55002 provides guidance for the implementation of an asset management system.

3. PRODUCT INFORMATION

This section provides information on 20 asset tracking and inventory systems. This market survey report does not cover all of the many commercial products on the market, but provides a cross section of the market that reflects the types of products, technologies, and solutions offered by major commercial vendors. Most vendors did not provide a price for their systems, primarily because the systems are highly configurable with various hardware that can be provided. Software costs may also depend on whether the vendor hosts the software, the number of users, the technologies selected, and the various software services selected by the customer. Vehicle tracking services ranged from \$10 - \$30 per vehicle per month.

Table 3-1 provides general product characteristics and/or specifications. Product information presented in this section was obtained directly from manufacturers, vendors, and their websites. The information has not been independently verified by the SAVER Program.

Product information in Table 3-1 is defined as follows, listed in column order:

Vendor indicates the manufacturer or distributor of the product. Some of the products may be available from multiple vendors.

Product indicates the product name.

Version indicates the version number of the latest software release.

Software Costs indicates the costs associated with purchasing the software and maintaining a license for use of the software.

GSA Schedule indicates whether or not the product is listed on the General Services Administration (GSA) schedule of products that are available at negotiated rates for government agencies.

Barcode Enabled indicates whether or not the software is integrated with barcode reading devices.

RFID Enabled indicates whether or not the software can read information from RFID tags placed on assets.

GPS Enabled indicates whether or not the software integrates with GPS tracking technology.

Supports iOS indicates whether or not software can be run on mobile devices such as the iPhone that use the Apple iOS operating system.

Supports Android indicates whether or not the software can be run on mobile devices that use the Android operating system.

E-mail Notifications indicates whether or not the software can be configured to send alerts and notifications by e-mail.

Text Notifications indicates whether or not the software can be configured to send alerts and notifications by text message, also known as short message servicing (SMS).

Chain of Custody indicates whether or not the software can log data for personnel assignments of an asset and issue a report on the asset's chain of custody.

Location History indicates whether or not the software can log and report the location history of an asset.

Maintenance History indicates whether or not the software can keep and update maintenance records for an item and issue a report on the item's maintenance history.

Training Available indicates whether or not the vendor provides training if desired by the user.

Table 3-1. Product Comparison Matrix for Asset Tracking and Inventory Systems

Vendor	Product	Version	Software Costs	GSA Schedule	Barcode Enabled	RFID Enabled	GPS Enabled	Supports iOS	Supports Android	E-mail Notifications	Text Notifications	Chain of Custody	Location History	Maintenance History	Training Available
Appian	Appian	16.1	NP	GS-35F-0092M	✓	NP	✓	✓	✓	✓	✓	✓	✓	✓	✓
AT&T	Fleet Manager	1.0	\$10 - \$12 per month per vehicle	GS-30F-CA051	No	No	✓	✓	✓	✓	✓	No	✓	✓	✓
A2B Tracking Solutions, Inc.	UC! Web	2.5.9	NP	GS-02F-0227R	✓	✓	✓	No	No	✓	✓	✓	✓	No	✓
CompassCom Software Corp.	CompassTrac	6.2	\$30 per month per vehicle	No	No	✓	✓	✓	✓	✓	✓	No	✓	No	✓
Curo International, LLC	iTrak	7	NP	No	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CYBRA Corp.	Edgefinity	4	\$15,000 for base platform	No	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Evanhoe & Associates, Inc.	AssetTrack	4.5	NP	No	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
E-9 Corporation	SwiftWork	1.0	NP	No	✓	✓	Opt	✓	No	✓	✓	✓	✓	✓	✓
Fleet Analytics, LLC	Pinpoint Fleet Manager	4.0	\$12 - \$19 per month per vehicle	NP	✓	✓	✓	✓	✓	NP	NP	NP	NP	NP	NP
Geographic Information Services, Inc.	The GeoMetri Platform	none	NP	No	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Asset Tracking and Inventory Systems Market Survey Report

Vendor	Product	Version	Software Costs	GSA Schedule	Barcode Enabled	RFID Enabled	GPS Enabled	Supports iOS	Supports Android	E-mail Notifications	Text Notifications	Chain of Custody	Location History	Maintenance History	Training Available
HRUCKUS LLC	Piper Bluetooth Inventory Tracking Solutions	NP	NP	No	No	No	✓	✓	✓	✓	✓	✓	✓	No	✓
Law Enforcement Intelligent Devices LLC	Biometric Access Control System	NP	NP	No	✓	✓	✓	No	No	✓	No	✓	✓	✓	✓
MAG Aerospace, Inc.	Dart UWB RTLS	NP	NP	GS-35F-123DA	✓	✓	NP	NP	NP	✓	NP	NP	NP	NP	✓
	WhereNet RTLS	NP	NP	GS-35F-123DA	✓	✓	NP	NP	NP	✓	NP	NP	NP	NP	✓
MASS Group, Inc.	TME AMS	5.9	\$191,000	GS-35F-0145Y	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Presidio, Inc.	AIO3 with Map Agent	3	Free with purchase of tracking device	No	No	No	✓	✓	✓	✓	✓	No	✓	No	✓
Shipcom Wireless, Inc.	CATAMARAN	11.0	\$144,000	No	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Skyfire Consulting, Inc.	Aerial and Ground-based RFID Solutions	NP	NP	No	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
VerdaSee Solutions, Inc.	VITAL First Responder	1.5	NP	NP	✓	✓	✓	✓	✓	No	✓	✓	✓	✓	NP

Vendor	Product	Version	Software Costs	GSA Schedule	Barcode Enabled	RFID Enabled	GPS Enabled	Supports iOS	Supports Android	E-mail Notifications	Text Notifications	Chain of Custody	Location History	Maintenance History	Training Available
Williams Software Associates Corp.	SmarTrack	3.0	NP	GS-35F-0143R	✓	✓	✓	NP	NP	✓	✓	✓	✓	✓	✓
		Notes: ✓—system is equipped with corresponding feature NP—information not provided Opt—Not provided as a standard offering, but can be integrated as a purchase option Feature—GSA=General Services Administration, RFID=Radio Frequency Identification, GPS=Global Positioning System													

Information in the table is based on data gathered from vendors and their websites from February – April, 2016.

3.1 Appian, Appian

Appian is business process model and notation (BPMN) software that allows users to build, use, and update custom applications. Users create graphical representations of business processes called business process models (BPMs). Appian software maps physical and data assets to BPMs, allowing users to take various actions that are orchestrated by a BPMN-compliant workflow engine. All actions are represented by graphical workflows that are initiated on cases and can trigger notifications, alerts, case updates, document uploads, and more. Appian provides a chronological and interactive collaboration interface to allow users to stay informed and for drilling down into further situational awareness. Appian unifies enterprise information in a single presentation layer, and provides holistic information for taking action.

Applications can be configured to define and track any type of asset or information. Examples of government-based use cases include managing leasing lifecycles for government buildings, tracking and regulating chartered banks, tracking reported safety hazards on military bases, and managing software lifecycles for aircraft weapons systems. Appian can read barcodes from Android and iOS mobile devices through the third-party Verifone Payware Mobile e255 app. Appian also integrates passive-tracking GPS via mobile GPS-based radios so that users know where assets have been. The software provides a field on electronic forms that allow users to auto-populate GPS coordinates from the GPS radio.

Applications can run on premise or as a cloud-based fully managed service. Appian is, by default, mobile enabled, so anything configured for secure viewing within the system is immediately viewable by mobile users using Appian's native application for iOS and Android devices. Contact the vendor for pricing. Technical support is available through a toll-free number, e-mail, chat, user guide, and frequently asked question (FAQ) page.

3.2 AT&T, Fleet Manager

AT&T Fleet Manager is a web-based location and telematics program that delivers automatic vehicle location (AVL) and other fleet intelligence data necessary for managing a fleet of vehicles. Customers receive near real-time vehicle locations, ongoing access to historical GPS data for response to investigation requests, comprehensive on-board engine diagnostic reports for preemptive vehicle maintenance, enhanced vehicle performance reports for capturing inappropriate driver behavior, extensive geo-fence (virtual barrier) and landmark features for proactive alerts, intuitive dashboards for displaying fleet performance against key agency performance indicators, and the ability to incorporate GIS layers on the mapping interface for users to easily reference custom maps. Fleet Manager can also analyze trends and provide data for increased fleet efficiency. The features and reports allow fleet managers to gain visibility into fleet activity and ultimately realize a return on their GPS/AVL investment.

Customers purchase an active-tracking GPS device for each vehicle that will be tracked. This device plugs into the second generation on-board diagnostics (OBD-II) port of the vehicle. The device is then tested, registered to the vehicle, and the vehicle is ready to go. The vehicle installation process is straightforward and results in minimal vehicle downtime. The cost of the device is \$100 per unit with an additional installation cost of \$46 per unit. Software charges are \$10 per month per vehicle for GPS tracking only, and \$12 per month per vehicle for GPS tracking and vehicle diagnostics. The software is web-based and accessible from a personal computer (PC), Macintosh (Mac), or iOS and Android mobile devices.

3.3 A2B Tracking Solutions, Inc., UC! Web

UC! Web is a web-based asset tracking and inventory management program that lets you define and capture serialized (standard items with assigned serial numbers) and non-serialized data. The program supports the Item Unique Identification (IUID) marking and compliance process mandated by the Department of Defense for giving equipment unique item identifiers (UIIs). Users create their own RFID labels and 1D and 2D Data Matrix barcodes and track items with automated data capture. UC! Web integrates with proprietary and third-party barcode readers and with RFID readers manufactured by Zebra Systems and Impinj, Inc. Passive RFID tags with a typical range of 12 – 50 feet and active RFID tags with a typical range of 250 – 600 feet are supported.

UC! Web tracks the custody, location, and condition of critical assets as they move across an organization and throughout their lifecycle. Inventory can be performed accurately and quickly by scanning items and reconciling against existing information. UC! Web allows capturing of detailed information such as contract line item numbers, acceptance codes, contract number and type, value, category, and status code. UC! Web has features and capabilities that integrate items into workflow processes and facilitate compliance in highly regulated environments. Users can output to a broad range of marking devices, match UIIs to an item pedigree, scan barcodes to move or transfer items to new locations, support embedded or parent-child asset relationships, manage assets to a location and custodian, track detailed asset information for compliance, view a history of item movement and condition, submit UII and non-UII data to the IUID registry, track calibration to prevent use of uncalibrated equipment, issue low-quantity warnings for items, and mark, track, ship, and update the status of any item throughout its lifecycle.

UC! Web runs in the cloud and is available on multiple web browsers. Integration with mobile phones and devices allow users to capture and mark any item at any time. Pricing for hardware and software varies with configuration and can be determined during solution evaluation. Customer service support is provided through a toll-free number and e-mail. Training is available, and there are no additional charges for a service contract.

3.4 CompassCom Software Corporation, CompassTrac

The CompassTrac App is web-based software that displays the location and status of vehicles and other high-value assets in real time. The location, date, time, and status of mobile assets are displayed in a browser-based viewer that uses ArcGIS mapping software from the Environmental Systems Research Institute (ESRI). A version of the program that supports any industry standard formatted mapping system is available for desktop installations. CompassTrac is scripted in Java and HTML 5. Information can be viewed and sized appropriately on the display for iOS and Android tablets and smartphones as well as laptops and workstations.

CompassTrac can track a wide variety of hardware including GPS receivers, RFID tags, Motorola two-way radios, and the most commonly used wireless modems from Cal Amp Wireless Network Corporation, Sierra Wireless Inc., Cradlepoint Inc., and many other companies. The program can be used as a common operating platform for tracking vehicles, assets, radios, laptops, smartphones, trailers, and heavy equipment. By displaying data on the widely-used ESRI mapping system, CompassTrac becomes a common operational platform for public safety personnel.

Assets can be located in real time in less than 5-second intervals. The program also locates addresses, places map pins at user-defined locations, provides map zoom and pan capabilities, supports satellite and aerial images in standard and compressed format, and provides visible or audible alerts based on discrete inputs. Users can visually replay location and status data for a vehicle, group of vehicles, or the entire fleet from a user-defined date and time. CompassTrac runs in an SQL or Oracle database environment, and has an application programming interface for integrating with third-party enterprise software for computer-aided dispatch and workflow management solutions.

Software charges are \$30 per month per vehicle without installation. Hardware and installation costs vary. Contact the vendor for more details. Training is normally not needed, but available for \$125 per hour not including travel and lodging. Customer support is provided through a toll-free number, e-mail, user guide, and video tutorial. Service level agreements are available that provide extra support, with price depending on the level of service.

3.5 Curo International LLC, iTrak

iTrak is a telemetry solution that supports asset tracking and inventory management. Telemetry is the highly automated communications process in which measurements are made and data is collected by receiving equipment at remote points. This data is captured with a wide range of technologies including barcode, RFID, GPS, and wired and wireless devices. iTrak provides real-time monitoring, visibility, and reporting of data. It answers the questions, “who, what, when, where, why, and what is the time for average turnaround?” iTrak supports a wide range of customers in defense, emergency response, law enforcement, oil and gas, manufacturing, logistics, and healthcare. Evidence, tools, medical supplies, vehicles, and more can be tracked and managed.

iTrak integrates any commercial barcode reader including smartphones and tablets with barcode reading apps. iTrak also supports RFID tags of any frequency including active, passive, and battery-assisted passive RFID technology. Both proprietary and third party RFID readers connect and communicate with iTrak. Assets with GPS receivers, Bluetooth Low Energy, and many other wireless transceivers can be tracked. The vendor claims that it currently tracks assets in 24 countries utilizing GPS.

iTrak is offered as a cloud-based service available in web browsers or installed on a server at the customer’s location. Users can access either configuration with PC’s, Macs, and mobile devices including iOS and Android. Pricing for hardware and software depends on the desired capabilities, the technologies utilized, and the number of assets. Customer support is provided by toll-free number to a 24 x 7 help desk, e-mail, chat, user guide, video tutorial, and FAQ page. Basic support is included, but other support contracts are available. On-site training is included with every product implementation with ongoing help built into each customer’s installation.

3.6 CYBRA Corporation, Edgenuity

Edgenuity is an RFID software product that includes a base platform with the essential functions required to read RFID tags and to define devices, locations, zones, companies, and rules. On top of the base platform are various apps that can perform inventory control, item/asset tracking, validation, and other functions. Edgenuity can be used to track and manage evidence, vehicles, medical supplies, tools, equipment, and personnel.

A common application is tracking emergency responders through assigned badges, using either GPS (if satellites are available) or RFID (on an ad-hoc grid that can be set up where needed). Automatic alerts can be sent based on loss of signal, loss of movement, or the pressing of a panic button on the badge. An embedded accelerometer on the badge can sense when personnel are disabled and generate an alert. Edgenuity provides real-time knowledge of the position of team members and critical equipment to incident commanders. Items and personnel can be paired in many arrangements (item:item, item:person, person:person, etc.) and an alert generated when a pair is separated.

Edgenuity inventory apps support barcode readers from all major hardware manufacturers and will scan barcodes from Android and iOS smartphones. The software also supports passive and active RFID tags from all major manufacturers and RFID readers from Alien Technology Corporation, Impinj, Inc., and Zebra Systems. Vehicle-mounted and man-portable tracking devices from CYBRA Corporation are GPS-enabled and will log and transmit GPS coordinates. Once a GPS-denied environment is encountered, the last known coordinate is flagged as such, and the software will switch over to RFID readers for triangulation or zone mapping.

Edgenuity runs on any web accessing device including tablets, iPhones (and other iOS devices), and Android smartphones. The cost of the base platform with 30 geographic zones that can be monitored is \$15,000. Additional zones range in price from \$180 to \$250 per zone depending on the quantity purchased. Apps range in price from \$8,500 - \$18,000 depending on the functionality required. Hardware modules can also be purchased; contact the vendor for pricing. Training is included with the high-end app purchase. Customer support is available by toll-free number, e-mail, chat, user guide, and video tutorial. Annual support costs are 18% of the licensed software.

3.7 Evanhoe & Associates, Inc., AssetTrack

AssetTrack is an asset tracking and management program developed by TrackX, Inc. and distributed by Evanhoe & Associates, Inc. The product was designed to provide real-time visibility and control of high-value assets to help increase asset and labor optimization in many different industries, including manufacturing, information technology, government, and healthcare. AssetTrack's flexibility allows users to build their own solutions and applications, such as tracking vehicles, manufacturing parts, computing devices, and returnable equipment. Users can monitor and manage an asset's inventory, owner, location, lifecycle, chain of custody, and maintenance history.

AssetTrack software includes barcode, RFID, and GPS tracking technologies. Evanhoe & Associates, Inc. integrates hardware solutions into the software and will perform site surveys and make hardware and tag selections, matching a solution to functional requirements. Proprietary and third-party barcode readers are available, and barcode-reading apps on smartphones may be integrated as well. RFID reader selection will depend on unique requirements and user environment. Readers from Impinj, Inc., Alien Technologies, and Zebra Systems can all be integrated with AssetTrack software. If GPS tracking is a requirement, Evanhoe will select the appropriate GPS tag and integrate it into the software.

AssetTrack can be installed on client-owned computers or run as a service in the cloud. It is accessible by any computing device with a suitable web browser, including iOS and Android mobile devices. Customer service is available by toll-free number, e-mail, chat, a user guide, and

FAQ page. Costs for hardware, software, and service support depend vary depending on user requirements. Contact the vendor for more information.

3.8 E-9 Corporation, SwiftWork

SwiftWork is a fully-integrated RFID/barcode data capture hardware and software solution for lifecycle management of inventory and assets. It is developed and maintained by The Swiftsure Group, Inc. and distributed by E-9 Corporation. Features include physical inventory count, verification and tagging, equipment sourcing, installation, project management, data management, and customizable report generation. The software enables specific items to be located and reconciled on handheld readers without line of site. Data screens are customizable for each user or organization. Check-out and check-in features enable automatic notification upon variances from expected events such as due dates. Re-order notifications of equipment and inventory can be automated when low inventory levels are reached. Weapons and first responder equipment check-out can be automatically managed with RFID tags.

SwiftWork works with third-party barcode readers from Technology Solutions Limited and Zebra Systems. Passive, active, and battery-assisted power RFID tags are compatible with the software, and RFID readers from Zebra Systems and Impinj, Inc. can be used without modifications to the software. GPS capability is not a standard offering, but can be integrated as an option if required.

SwiftWork can be installed on agency computers, operate as a cloud service, or as a hybrid depending on the customer's wishes. Unix/Linux and iOS devices are supported. Pricing depends upon the project size, number of users, level of integration and customization required, and whether the system is internally or externally hosted. E-9 Corporation will select hardware for user requirements and provide setup, training, hosting, and maintenance according to customer needs. Telephone and e-mail customer support is available as well as user guides and hands-on training.

3.9 Fleet Analytics, LLC, Pinpoint Fleet Manager

Pinpoint Fleet Manager is a cloud-based Software-as-a-Service asset and inventory management system. Utilizing a variety of commercially available cellular, satellite, RFID, GPS, and Wifi remote terminal devices with connected sensors, Pinpoint Fleet Manager remotely captures sensor data from vehicles, farms, oil fields, warehouses, and various other environments. Integrated devices allow for the real-time tracking of assets and provide emergency and panic-alert functionality.

Pinpoint Fleet Manager utilizes both passive and active GPS devices to locate assets, equipment, and vehicles. When using active GPS devices, Pinpoint Fleet Manager will utilize the vehicle or equipment power to collect and transmit status data such as engine on/off status, idling status, speed, heading, altitude, harsh braking, and harsh acceleration. Vehicle data analytics and driver scoring are provided by the software. Pinpoint Fleet Manager will also work with barcode readers from Wasp Barcode Technologies, Inc. and RFID readers from Intermec, Inc. in order to provide inventory management and other functions.

Pinpoint Fleet Manager requires client software installation. Once installed, the software runs in web browsers and is compatible with Internet Explorer version 11, Chrome, Firefox, and Safari. Pinpoint Fleet Mobile can also be installed on Android and iOS devices. The cost of the software

including satellite or cellular communications is \$12 - \$19 per vehicle per month depending on the level of service. Active GPS tracking devices range in price from \$100 - \$250 each. Passive RFID tags cost approximately \$2 each, while active RFID tags range in price from \$8 - \$12 each. Customer service is provided by toll-free number, e-mail, user guide, and FAQ page.

3.10 Geographic Information Services, Inc., GeoMetri Platform

The GeoMetri Platform (consisting of GeoMetri Enterprise, Navigator, and Point) is software that provides real-time location technology analysis, indoor navigation capabilities, and geospatial maps to track dynamic movements of persons or objects. The GeoMetri Platform combines spatial and statistical engines that can be used with existing and emerging technologies. Its design allows users to customize applications to their needs. The location technology can be used to track people, vehicles, medical kit inventory, tools, as well as providing geospatial maps for federal, state, local, and private organizations. It also provides a method to track first responders and equipment in emergency situations, including indoor and outdoor mapping with near real-time positions.

In addition, GeoMetri Navigator can create searchable indoor and outdoor maps of buildings from indoor floor plan data, optimizing it so that users can search for and navigate to points of interest using a smartphone. Indoor routing and navigation options support multiple floors, stairs, escalators, elevators, and other alternative paths to reach the desired destinations. The GeoMetri Platform's indoor positioning technology options can provide indoor positioning accuracy within a few meters. Enhancements to the existing infrastructure can achieve sub-foot accuracy. A variety of positioning sensors in the smartphone are evaluated for each venue and application including Wifi, magnetic fields, compass, atmospheric pressure, accelerometer, Bluetooth, and GPS. Geo-fencing, iBeacon and Bluetooth Low Energy options can deliver relevant content to customers based upon their entering, dwelling or leaving a location.

The GeoMetri Platform is an open system that can be integrated with any barcode or RFID system or protocol as long as there are no copyright or ownership issues. The platform handles both passive and active GPS tracking. When deployed with the indoor mapping capability, the system will switch between indoor and outdoor tracking seamlessly and transparently to the user. It monitors signal strength of both, and uses whichever one provides the most accurate location. The platform has also been integrated with tracking beacons and multiple sensor systems. The GeoMetri Platform can be used with PC, Mac, servers/routers, mobile devices (including Android and iOS), and can also be customized to meet the client's needs.

Geographic Information Services, Inc. (GISi) is a value added reseller for the manufacturer GeoMetri, Inc. GISi will customize a solution for the customer's needs. System setup and implementation costs depend upon existing infrastructure, needed accuracy, and the amount of indoor area to be mapped. Hosting is part of the total cost of the system, which can be paid monthly or annually. The base platform does not include additional hardware unless it is needed to supplement the existing Wifi/Sensor network. GISi does provide additional sensors and tracking devices if needed. GISi has partner agreements in place to provide any needed hardware for barcode or RFID deployment.

3.11 HRUCKUS LLC, Piper Bluetooth Inventory Tracking Solutions

Piper Bluetooth Inventory Tracking Solutions is a software platform developed by Piper, Inc. and distributed by HRUCKUS LLC. The platform helps manufacturers, warehouses and fleet

managers improve operations by better tracking their assets and collecting valuable analytics. Using inexpensive Bluetooth Low Energy (BLE) proximity devices and always-on real-time secure sensors, companies can manage location-based data to power a large number of solutions across departments and budgets. Piper's platform provides the modularity needed to be responsive with a focus on interoperability and adaptation to existing technology investments and infrastructure. Designed for real time data collection, the Piper sensors enable enterprise customers to monitor BLE activity, map it according to requirements, and convert the data into useful analytics. It's an ideal solution for a variety of manufacturing and transport segments including asset tracking, fleet management, product locating, team notifications, and environmental awareness.

Emergency responders can use the Piper platform for evidence management, vehicle and mobile asset tracking, medical kit inventory, and tool and equipment tracking and accountability. The software can be hosted in the cloud or installed on premises and will run on any computing device with a web browser, including Android and iOS smartphones. Passive-tracking and active-tracking GPS applications are supported. Pricing is available on request and will vary due to the highly customizable nature of the product. Customer support is available through e-mail and a user's guide. There are no additional charges for customer support.

3.12 Law Enforcement Intelligent Devices LLC, Biometric Access Control System

Biometric Access Control System (BACS) is an RFID-based asset management and inventory control software that includes biometric technology such as fingerprint scanners, which ensures a high level of security, accountability, and reporting integrity. Additional levels of security that are available with the system include a hand geometry scanner, card reader, and barcode reader. The software secures a person's credential, provides a chain of custody for asset and equipment tracking, and provides maintenance tracking of equipment with notification and lock-out options. BACS is currently used at military and law enforcement facilities, hospitals, libraries, and private businesses to secure, track, and provide full accountability of critical assets such as weapons, evidence, night vision goggles, radios, laptop computers, and medical supplies.

The BACS system can greatly reduce the amount of emergency responder equipment purchased by sharing inventory between shifts rather than individually issuing equipment to every officer. BACS does more than just check the equipment in and out of a room, but also provides inventory control for the equipment in the equipment room and for all of the officer's weapons. The system issues weapons and equipment to officers, restricting their access to only the items they are qualified to use. BACS is built with equipment maintenance in mind and allows an officer to tag an item for needed maintenance. Once installed, loss of equipment can be reduced and uptime increased due to prompt maintenance and repairs.

When BACS is used as an inventory system, anything that is logged by paper can be integrated into the system by appropriate tagging. BACS reads major third-party barcode readers, RFID readers, and supports passive-tracking and active-tracking GPS devices. The BACS system is a web-enabled remote management system running on a centralized computer kiosk. This centralized system can be integrated into the customer's network and configured to send e-mail notifications. Contact the vendor for pricing. Customer support is included for one year with purchase and provided by a toll-free number, e-mail, and a user guide. Optional multi-year extended service plans are available starting in the second year.

3.13 MAG Aerospace, Inc., Dart Ultra-wide Band Real-time Locating System

The Dart Ultra-wide Band Real-time Locating System (UWB RTLS) is a system of sensors, tags, and software developed by Zebra Systems and distributed by MAG Aerospace, Inc. The system is designed for applications requiring accurate, precise, and frequently updated real-time location of assets. Sensors and tags use patented ultra-wide band techniques and have batteries that last up to seven years with a once per second rate of update. The system performs in high multipath environments with a throughput of 3,500 tags per performance hub. Tags and sensors can be located accurately to within 1 foot line of sight from a 200 meter range. Dart Tags are IP67ⁱ rated for the harshest environments and programmable for differential transmission rates, allowing varying levels of location accuracy based on specific, asset-unique requirements

Dart UWB RTLS allows for many types of asset management applications, including evidence management, medical kit inventory, and tracking of tools, equipment, and personnel. Emergency response organizations can accurately track personnel and equipment indoors and out, with real-time connectivity provided between critical assets and the people and information systems that manage them. Dart UWB RTLS also manages and integrates the many disparate systems of personnel and equipment in emergency response agencies.

The Dart UWB RTLS system consists of a Dart Hub, Dart tags, System Builder, Dart Vision Reader, and a DartWand Module. The Dart Hub runs the real-time locating software that covers an entire facility with thousands of tag location updates per second. Dart tags are small battery-operated devices that are generally affixed to assets. Dart badges are low-profile sensor tags generally affixed to equipment or personnel. System Builder is planning software that is used to define the site and sensor coordinate system, model the sensor coverage, and manage and optimize the installation. Dart Vision Reader is software that provides presence detection (as opposed to location) and allows organizations to create presence zones of various sizes. The DartWand Module is a small tabletop device used to configure and inventory Dart tags. With the DartWand, users can turn tags on or off and set their update rate from 200 times per second to once every 100 seconds. Barcodes are used for configuration and management of Dart tags only. RFID tags are compatible with the system and can be used if desired.

The Dart UWB RTLS is available on the GSA schedule under contract number GS-35F-123DA. Pricing can be found by searching online or by contacting the vendor. Customer support is provided by a toll-free number, e-mail, a user guide, FAQ page, and online community support. Extended service contracts can be purchased.

3.14 MAG Aerospace, Inc., WhereNet Real-time Locating System

The WhereNet Real-time Locating System (RTLS) is a system of RFID tags and software developed by Zebra Systems and distributed by MAG Aerospace, Inc. The WhereNet system was designed for applications requiring the ability to sense objects and personnel across a large space, and for operations in all types of environments. WhereNet has been used to track and manage assets in marine terminals, automobile manufacturing plants, and at U.S. Air Force overhaul facilities. Tags have a battery life of five to seven years and provide three meter accuracy at a one kilometer range, and will operate in complex and hazardous environments.

ⁱ Ingress protection rating indicates product is dust-tight and protected from water ingress when immersed in 1 meter of water.

Tags and WhereLan sensors (RFID readers) are virtually maintenance free over their lifetimes. An integrated visibility software suite facilitates system deployment, provides a web-based end user asset visibility application, and is designed as an embedded location engine interfaced to existing enterprise systems. Refer to the preceding section under the Dart UWB RLTS for pricing and customer service information.

3.15 MASS Group, Inc., Traceability Made Easy Asset Management System

The Traceability Made Easy Asset Management System (TME AMS) is commercially off-the-shelf software that allows organizations to build and maintain a comprehensive record of assets such as tools, vehicles, and personnel. Possible applications include evidence management, vehicle tracking, and asset management and inventory for firearms, tools, and medical kits. TME AMS integrates barcode, RFID, and GPS tracking technologies, and allows thousands of assets to be tracked across multiple locations. TME AMS provides real-time data on all inventory and assets used for facilities management. Items can be tracked by serial number or any user-specified field. Administrators and managers can retrieve real-time data on available quantity, locations, movements, personnel assignments, quantity consumption levels, expiration dates, etc. All data is collected and managed through a Structured Query Language (SQL) database for the product's lifecycle. This provides genealogy and traceability information to meet compliance for commercial and governmental regulations.

TME AMS integrates several models (DS-4808, DS-6878, LS-2808, LI-4278, and LS-1203) of barcode readers manufactured by Zebra Technologies, Inc. All major 1-D and 2-D barcode formats are supported. TME AMS can be configured to operate with all third-party RFID hardware and is specifically designed to plug and play with RFID readers from Alien Technology Corporation. Passive and active GPS tracking can also be implemented via Google Maps.

TME AMS can run on premises or be hosted through MASS Group, Inc.'s secure hosting server. Applications can run on Windows computers and all mobile devices including iOS and Android smartphones. A typical homeland security software configuration including licensing with one-year maintenance for 10 power users, 500 standard users, 100 report users, and 1,000 requesters would cost \$191,000. Typical annual maintenance support and licensing after the first year would be \$26,620. Prices scales up or down depending on the number of users needed. Onsite training for two days can be purchased for \$3,500. Contact the vendor for more specific information.

3.16 Presidio, Inc., AIO3 with Map Agent

The AIO3 is a third generation covert and overt GPS tracking device that includes self-contained GPS cellular antennas along with an internal lithium ion rechargeable battery. The AIO3 measures 2.8 by 2.0 by 0.7 inches and includes power-saving navigation algorithms that allow the device to obtain positions in difficult and hard-to-operate scenarios. The AIO3 is designed to meet MIL-810 environmental specifications and can operate from -20 to +70 degrees Celsius. The AIO3 is designed to support extended operational run times with Presidio's supplemental rechargeable battery cases that measure 4.5 by 2.75 by 1.0 inches. The AIO3 also supports external power and General Purpose Input/Output control, allowing users the versatility of controlling or monitoring external events.

The AIO3 is fully compatible with Presidio's proprietary mapping software known as Map Agent. The Map Agent client and web-based applications are both law enforcement specific applications. Using these applications the user can track asset location in real time, log asset location data, set Geofence boundaries, set "stop time" reports indicating how long a device has been at a location based on user-defined parameters, control access to GPS data based on state boundaries or warrant dates, set the GPS update rate from once per day to once every 3 seconds, set power saving features, and set e-mail or text notifications based on power on/off, movement, geofence boundary violations, tampering, or low battery. The software also allows users to play back movements of assets based on collected GPS data and export data to Excel or Google Earth file formats for analysis and presentation purposes.

The AIO3 communicates with a web-based server located within Presidio's facility. Using the web-based or client application, the user has access to the data. The AIO3 also operates with the Department of Justice Unitrac asset tracking software. For special applications, Presidio can support users hosting the data portal for accessing and storing data. Administrative users can assign user access privileges. The software is free of charge for users who purchase the AIO3 asset tracking device. The AIO3 requires a yearly wireless service contract which is purchased through Presidio. Price is available upon request. Customer service is available through a toll free number, e-mail, chat, and a user guide.

3.17 Shipcom Wireless, Inc., CATAMARAN

CATAMARAN is business middleware with a rapid application development environment that provides various modules and tool sets to achieve a high level of integration between asset tracking and business processes. As middleware, it enables various components of an organization's computing system to communicate and manage data. The CATAMARAN platform runs on multiple mobile devices, including Android and iOS smartphones. It supports and provides organization-wide integration, automates work flow processes, manages and maintains electronic records, and collaborate with location and inventory control technologies such as barcode, passive RFID, active RFID, RTLS, and GPS. Standard interfaces to third-party software products such as Oracle and SQL Server are provided.

CATAMARAN's real-time integration with mobile and sensor-based applications enables law enforcement and emergency response agencies to provide real-time tracking and updating of asset data. Responders can quickly assign and print tags on the fly to locate and track equipment, personnel, civilians, or other assets. Real-time and near real-time updates are collected from tags, sensors, or back-end systems and are continuously fed to CATAMARAN's enterprise dashboards, providing real-time situational awareness for operations centers. CATAMARAN provides native interfaces to electronic medical records and can be configured to easily identify emergency caches for use in responses.

CATAMARAN integrates with a range of Motorola mobile barcode readers, including the model MC-55A hand-held with Wifi. RFID tags from many different vendors can be used with CATAMARAN. Typically, passive RFID tags have a 3-meter range and 512 bits of user memory, while active tags have a 400-meter range, 5 year battery life, and 1 kilobit memory. Shipcom has the ability to install long- and short-range RFID readers from Impinj, Inc. and other third-party vendors to provide additional scanning solutions as needed. For optimum accuracy, our engineers will analyze the environment in order to propose the proper application. We place readers strategically in order to achieve the maximum asset visibility in warehouse and loading

dock environments. When the assets are received, the readers pick up the information on the product and immediately transfer it to the database.

Licenses for four different software modules are available for purchase. The main platform (called the Integration and Process Analytics Server) costs \$60,000, the Emergency Medical Record Module costs \$24,000, the Asset Tracking Module costs \$30,000, and the RLTS module also costs \$30,000. Hardware prices are available from the vendor. Customer support is available through a toll-free number, e-mail, user guide, video tutorial, and FAQ page. There is no charge for a customer support package. However, customization, system integration, and other requirements are covered in the services contract negotiated on the project.

3.18 Skyfire Consulting, Inc., Aerial and Ground-based RFID Solutions

Skyfire Consulting, Inc. manufactures unmanned aerial vehicles (UAVs) and distributes asset tracking software from SmartX, Inc. and other vendors, providing a wide range of aerial and ground-based tracking applications for fire departments, law enforcement agencies, and other public service entities. Real-time tracking and geotagging of assets can be accomplished with multiple technologies including short- and long-range RFID, GPS, Wifi, and Bluetooth. A truck's inventory can be checked in seconds, and managers can be alerted when an item is left behind or placed on another truck. Fire departments can monitor large fire scenes with UAV-based technology and track people and equipment in real time on an interface similar to Google Maps. RFID bracelets can be issued to swimmers at a beach (up to 10,000 at a time), and the software will continuously monitor how many are swimming versus how many are on a beach at any given moment. If a swimmer is missing, Skyfire Consulting, Inc.'s UAV will take off, autonomously fly a search pattern, and locate them. Custom solutions can be designed for emergency response agencies.

Secure cloud-based tracking software can be run on any computer and most mobile devices, including Android and iOS smartphones. Pricing for hardware and software will vary with the application, technology, and number of users. Contact the vendor for more information. Customer service is provided by a toll-free number, e-mail, user guide, video tutorial, and FAQ page.

3.19 VerdaSee Solutions, Inc., VITAL First Responder

VITAL First Responder is a suite of software modules designed to provide real-time information about emergency responders to incident commanders. All modules are designed for fast and accurate location readings and provide fully automated data capture. VITAL Mesh Network establishes an independent mobile network that surrounds an incident area and creates a communication capability that functions within multi-story buildings and in wide, densely populated areas. VITAL Point of Entry and VITAL Point of Exit track entrance and exit points for each responder. VITAL Dynamic Location tracks the responder's actual location in three dimensions during an incident. VITAL Timing and Alarm tracks which responders are at the incident, where they are, and any relevant exposure information such as amount of available compressed air. All related hardware adds negligible weight to the responder. Once activated, each module requires no effort from the responder while providing real-time data and visibility to the incident commander.

VITAL First Responder can incorporate active, battery-assisted, and passive RFID tags as well as GPS active (cellular) and GPS passive applications, all managed by VITAL Navigator

middleware servers and applications modules. Off the shelf components can also be incorporated into the suite of modules. Range can generally be 100 meters to 10 kilometers depending upon the specific hardware selected. Battery life will typically range from 3 – 10 years based on end user requirements. Barcode scanners can be integrated for inventory purposes. Software can be installed on PCs, servers, and mobile devices including Android and iOS smartphones. Business rules established by the end user allow modules to proactively send notifications as events occur and allow end users to query the data-reporting application for interim reports. Prices depend upon hardware and software configuration. Contact the vendor for more information.

3.20 Williams Software Associates Corp., SmarTrack

SmarTrack is an asset life cycle management system that allows for tracking and management of all types of assets from large vehicles to small parts in a manufacturing plant. SmarTrack uses smart cards, personal identification numbers, biometrics, IUID tags, RFID, and 2D barcoding to inventory, track, trace, account, maintain, issue, and receive equipment for all critical and non-critical unit property. The system produces approved forms and publications for each transaction thus providing an electronic copy of each and every system transaction. SmarTrack comes in specialized versions for military, law enforcement, parts room, and warehouse versions. All versions include the use of optional RFID tagging, GPS tracking, and real-time live tracking of people and equipment for transportation, delivery industries, and law enforcement environments.

SmarTrack runs on Windows-based computers, servers, routers, and mobile devices. Proprietary barcode and RFID readers integrate with the software. SmarTrack comes with a GPS SQL server that allows live tracking of tagged assets with 10-digit grid coordinates and a live map of asset locations. The system allows users to track vehicles and people and provides two-way communication devices, a complete travel history, and emergency alert capability. The GPS server can be installed on premises or hosted remotely.

Customer support is provided by e-mail, chat, user guide, and FAQ page. Pricing depends upon configuration, hardware, and level of service. Contact the vendor for more information.

4. VENDOR CONTACT INFORMATION

Additional information on the asset tracking and inventory systems included in this market survey report can be obtained from the vendors listed in Table 4-1.

Table 4-1. Vendor Contact Information

Vendor	Address/Phone Number	Website/E-Mail
Appian	11955 Democracy Drive #1700 Reston, VA 20190 703-442-2550	www.appian.com info@appian.com
AT&T	1900 Gallows Road Vienna, VA 22182 703-624-9038	https://www.wireless.att.com john.macaluso@att.com
A2B Tracking Solutions, Inc.	207 High Point Avenue Unit 4 Portsmouth, RI 02871 800-733-7592	www.a2btracking.com sales@a2btracking.com
CompassCom Software Corporation	12353 E. Easter Avenue Centennial, CO 80112 (800) 787-0651	www.compasscom.com edcrowe@compasscom.com
Curo International, LLC	12941 Midori Drive Anchorage, AK 99516 907-868-7795	www.curointernational.com kimberly.gray@curointernational.com
CYBRA Corporation	28 Wells Ave Building 3 Yonkers, NY 10701 914-963-6600	www.cybra.com dgrey@cybra.com
Evanhoe & Associates, Inc.	5089 Norman Blvd. Dayton, OH 45431 937-235-2995	www.evanhoe.com sales@evanhoe.com
E-9 Corporation	6551 Loisdale Court Suite 530 Springfield, VA 22150 609-332-3485	www.e-9corporation.com cveale@e-9corporation.com
Fleet Analytics, LLC	7630 Stratton Point Suwanee, GA 30024 770-329-0847	www.pinpointfleet.com gary@fleetanalytics.net or info@pinpointfleet.com
Geographic Information Services, Inc.	2100 Riverchase Center Suite 105 Birmingham, AL 35244 205-941-0442	www.gisinc.com sonny.beech@gisinc.com

Vendor	Address/Phone Number	Website/E-Mail
HRUCKUS LLC	2363 Champlain Street NW 2 Washington, DC 20009 757-575-5205	www.piper.ly hruckus@hruckus.com
Law Enforcement Intelligent Devices LLC	2110 E Walton Blvd. Suite F Auburn Hills, MI 48326 1-888-884-5343	www.leidproducts.com info@leidproducts.com
MAG Aerospace, Inc.	13580 Groupe Drive Suite 200 Woodbridge, VA 22192 703-376-9883	www.magaero.com fhoang@mag-ds.com
MASS Group, Inc.	21601 Devonshire Suite 108 Chatsworth, CA 91311 818-709-1255	www.massgroup.com nbalady@massgroup.com
Presidio, Inc.	5337 Millenia Lakes Blvd. Suite 300 Orlando, FL 32839 407-641-0421	www.presidio.com tdimatteo@presidio.com
Shipcom Wireless, Inc.	11200 Richmond Avenue Suite 552 Houston, TX 77057	www.shipcomwireless.com mkarlioglu@shipcomwireless.com
Skyfire Consulting, Inc.	120 N Candler Street Suite 6 Decatur, GA 30030 404-220-7783	www.skyfireconsulting.com info@skyfireconsulting.com
VerdaSee Solutions, Inc.	17825 W Pond Ridge Circle Gurnee, IL 60031 847-226-4057	www.verdasee.com reuben.vazquez@verdasee.com
Williams Software Associates Corp.	8810 Westgate Park Drive Suite 102 Raleigh, NC 27617 910-263-1933	www.wsacorp.us al@wsacorp.us

5. SUMMARY

This market survey report provides information on 20 asset tracking and inventory systems. An important consideration in the selection of an asset tracking and inventory system is the tracking technology. All products covered in this report integrate one or more of the main asset tracking technologies – barcode, RFID, and GPS. Barcodes must be read one by one by a scanner in line of sight of the items, while many RFID tags can be read quickly from hundreds of feet away. GPS devices can provide exact location by communicating with orbiting satellites and communicate real time location information to tracking software. Other technologies, such as ultra-wide-band radio and BLE can be used for real-time tracking of assets as well.

Asset tracking and inventory software can integrate with an agency’s computing network or be hosted by the vendor and accessed on computers, laptops, and mobile devices. Software is generally highly configurable and can be set up to issue alerts and notifications when items are separated, cross a geographic boundary, need maintenance or support, or for many other reasons. Asset tracking and inventory software is useful for any organization that wishes to have better control of its personnel and equipment.

Emergency responder agencies that consider purchasing asset tracking and inventory systems should carefully research each product’s overall capabilities and limitations in relation to their agency’s operational needs