

AVL/ITS for DES Fleet Vehicles

Radio Satellite Integrators, Inc.



Proposal to

City of Rochester

Request for Proposal

August 3, 2012



City of Rochester, NY





Radio
Satellite
Integrators, Inc.

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August 3, 2012

Carol Schmitt
City of Rochester - Information Technology
Public Safety Building
185 Exchange Blvd., Suite 530
Rochester, New York 14614

Re: Request for Proposal – AVL/ITS for DES Vehicle Fleets

Dear Ms. Schmitt,

Please find our attached response for **Request for Proposal – AVL/ITS for DES Vehicle Fleets**. Radio Satellite Integrators (RSI) is a world leader in the manufacturing and implementation of vehicle tracking systems using GPS technology. We have a long history of experience with GPS-based Automatic Vehicle Location systems and have been manufacturing and implementing systems since 1990. RSI has unparalleled experience implementing systems for all types of vehicle fleets. We currently have systems in place all over the country with large municipal governments such as: City of Houston, City of Oklahoma City, Miami-Dade County, City of Phoenix, Boston Water & Sewer, among many others.

With more than 300 systems and thousands of mobile units in place throughout the world, we urge you to learn more about how our approach allows us to offer a superior product that will best suit your needs at a great value.

Please feel free to contact me with any questions, concerns, or requests.

Proposer Contact:

Brett Lim
Phone: (310) 787-7700
Fax: (310) 787-7435
email: blim@radsat.com
Web page: www.radsat.com

Sincerely,

A handwritten signature in blue ink, appearing to read "Brett Lim", is written over a light blue horizontal line.

Brett Lim
Director of Marketing



**Radio
Satellite
Integrators, Inc.**

City of Rochester



City of Rochester, NY

**Automated Vehicle Locator
(AVL) and Intelligent
Transportation System (ITS)
for the Department of
Environmental Services
Vehicle Fleet**

**Project No. 09423/ PIN
4754.47**

August 3, 2012



**ESRI
Technology**

**AUTHORIZED
BUSINESS PARTNER**

Automatic Vehicle Location





**Radio
Satellite
Integrators, Inc.**

City of Rochester
Project No. 09423/PIN 4754.47
AVL & ITS for Department of Environmental
Services Vehicle Fleet
August 3, 2012



City of Rochester, NY

Title Page

Company:

Radio Satellite Integrators, Inc.

Contacts:

Brett G. Lim

Director of Marketing

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19144 Van Ness Avenue
Torrance, California 90501 USA

Date:

August 3, 2012

Subject:

RSI Response to City of Rochester's Project No. 09423/PIN4754.47: AVL and ITS for the Department of Environmental Services Vehicle Fleet





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Executive Summary

Our Commitment

Radio Satellite Integrators (RSI) has provided Automatic Vehicle Location (AVL) and mobile data systems that work to the highest levels of performance, reliability, and scalability since 1990. We are one of the oldest and most experienced AVL systems manufacturers and integrators in the industry and we have notable experience with local government and various utility fleets. Radio Satellite Integrators stands ready to support our services and products with the high standards demanded by entities like City of Rochester.

Our AVL Experience

RSI has implemented over 300 AVL systems in thousands of vehicles and has the largest breadth of AVL experience of any company in the world. RSI leverages this real world experience with municipal and government fleets similar to City of Rochester to offer you the highest performing and most reliable systems on the market.

City of Rochester Objectives:

City of Rochester seeks an Automatic Vehicle Location system to meet the unique requirements of its vehicle and dispatch operations for its vehicles. In addition, the customer can have this enterprise system fully integrated with ESRI ArcGIS, work order, or other fleet management systems. These systems provide the customer with the tools for faster and more efficient dispatching along with real-time and historical data that can be used for a variety of administrative tasks or analysis.

City of Rochester desires to implement an AVL system to enhance the ability to efficiently manage the assignment of vehicle operations; to use the AVL and Mobile Data system to increase safety, productivity, and service to the citizens in your area of operations.

The RSI Solution:

The RSI AVL system will establish a wireless gateway between your vehicle fleet and your base dispatch. The RSI AVL system will provide real-time vehicle location and status data on an ESRI ArcGIS Server based map interface (hosted servers).

An RSI Mobile unit will provide vehicle location and status data for the system as well as serve as the wireless link between vehicle and base. The mobile GPS device can be equipped with serial ports and sensors to integrate to virtually any devices and external status signals, such as ignition on/off, door open/shut, lights, arm, data terminal, navigation device, etc.



RSI System Equipment

An RSI AVL solution consists of in-vehicle equipment and base applications and equipment.

The ***In-Vehicle Equipment*** is centered on the RSI Mobile Unit, a self-contained unit integrating GPS location and sensor technologies, as well as wireless communications. The GPS unit can be connected to any devices or sensors including lights, ignition, doors open/closed, alarms, etc. In addition, any variety of in-vehicle computing devices such as Navigation Devices or MDT's can be connected to the mobile unit and mounted for a driver interface to the system in the future.

The ***Base Application*** is based on ESRI ArcGIS Server and can be implemented in a variety of configurations including either hosted or local Web browser based applications. Users interact with the system through industry-standard ESRI GIS mapping tools as well as customized reporting applications. The base application servers are typically hosted off-site by RSI.

The In-Vehicle Equipment and Base Application are linked via two-way cellular wireless communications, allowing for timely data transmission between the field and dispatch center.

Wireless Communications

- **RSI can use virtually any wireless carrier for the communications portion of this system. We are proposing GPRS from AT&T, because we feel that it is the best combination of coverage and value. Verizon/Sprint CDMA is available as an option.**

RSI has worked with more communications technologies in our 20+ years of technology leadership than any other vendor in this marketplace. RSI AVL systems can use any type of public data network (cellular) including: GPRS, GSM, EV-DO, Nextel/iDEN, CDMA, and many others.

Using various types of mobile units, RSI also has the capability to field hybrid solutions, which use a combination of multiple communications mediums simultaneously such as satellite, WiFi, two-way radio, and others.

Please see the Wireless Communications Section in the proposal.



Third Party System Integration

One of the main differences between RSI and other AVL providers is our unparalleled experience with integrating our AVL and mobile data systems with third party applications. RSI has worked with dozens of third party providers of scheduling, dispatch, work order management, maintenance, as well as “home-grown” applications for various agencies.

RSI has extensive experience interfacing with all types of third party applications such as:

- Work Orders
- Maintenance
- Scheduling
- Dispatch
- Routing
- GIS

RSI is able to leverage its vast engineering experience to allow for the easy integration and real-time sharing of all system data with third party applications. In addition, the RSI AVL system provides a wireless gateway for these systems to share and update data from a driver interface in the vehicle. RSI has written interface programs specific to a number of such applications (using methods such as Web Services, ESRI Map Services, COM/DCOM, ODBC, XML, SOAP/REST, TCP/IP sockets, CORBA, data queues in an AS/400 environment, network files, etc.).

With dozens of customized integrated systems in place throughout the world, full system integration is just par for the course with the RSI system.

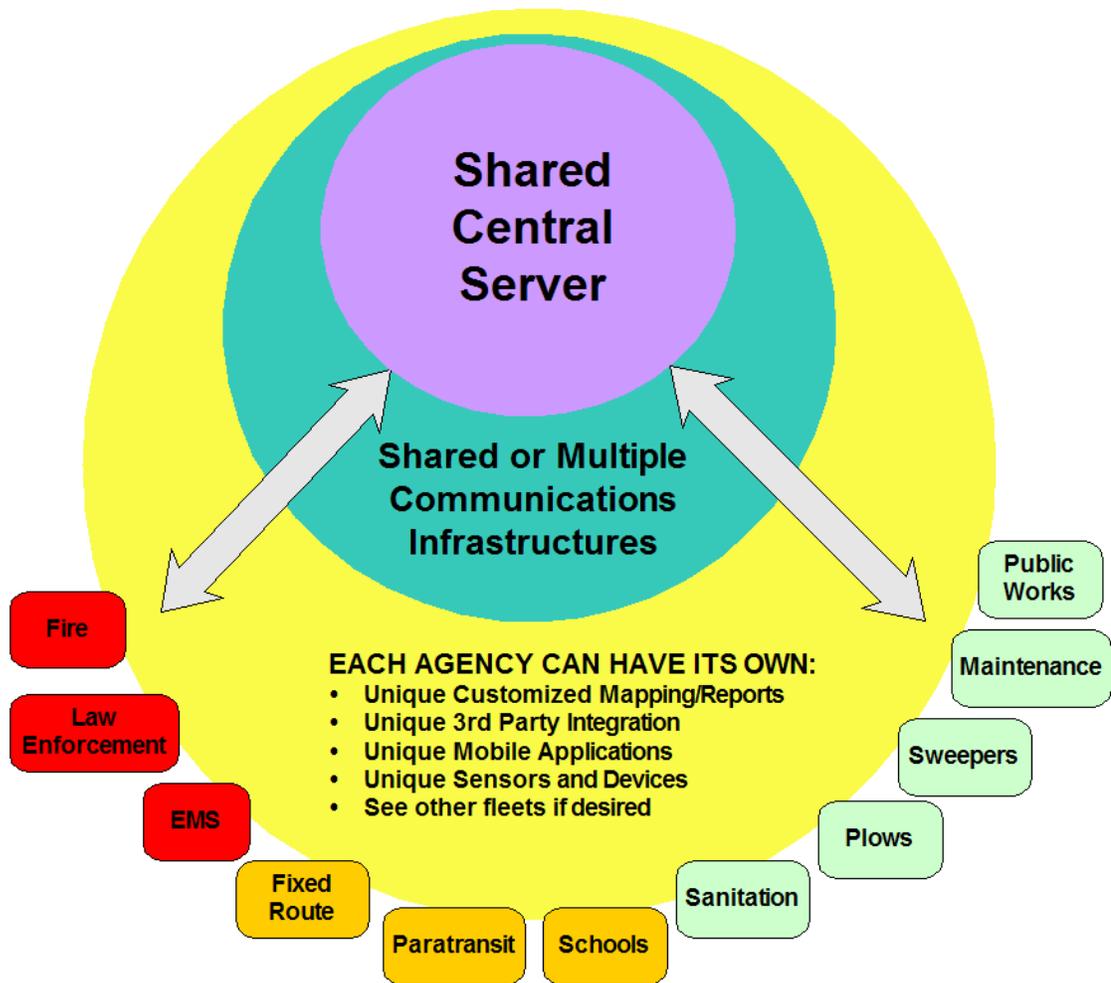


Enterprise Shared Multi-Agency Systems

RSI has extensive experience implementing large enterprise systems that can be shared by several agencies within one organization, city, county, etc. The RSI system can be configured so that specific users only view their own vehicle fleet group, but the system will share the same backbone, servers, communications, etc.

For instance a city may only have to invest in one system yet their fire, transit, and public works departments can all use and share that same system.

RSI has implemented these shared enterprise systems for a variety of cities and counties throughout the country including many of the largest metro governments in the country.





Company Background Information

Company Overview:

Radio Satellite Integrators, Inc. (RSI) designs, manufactures and implements integrated vehicle tracking and mobile data systems utilizing the Global Positioning System (GPS) and wireless communications. Based in Torrance, California, the company was founded with the mission of providing high-performance, low-cost systems for tracking mobile assets with GPS. RSI has focused its research, product engineering, and design efforts on the development of systems that are reliable, easy to use, and fully customizable.

Company History:

RSI was founded in 1990 to address the emerging needs of integrating GPS technology with wireless communication systems and Geographic Information System (GIS) digital mapping technology. The company has more than 300 tracking systems and thousands of mobile units in place worldwide.

Company Products:

RSI is continually developing, upgrading, and customizing its core product: The RSI AVL System featuring the RSI Mobile unit. RSI currently ships several different models of mobile units which represents the most advanced vehicle tracking technology on the market for fleet management and AVL systems. Designed to keep one step ahead of the ever-evolving world of wireless communications, RSI has the capability to use multiple communications systems for vehicle data reporting. An upgrade path is also provided to new or additional communications methods as they are developed. The RSI unit can utilize virtually any communications link including: cellular, GSM/GPRS, CDMA, two-way radio, and satellite solutions.

RSI Mapping applications offer a choice of true client/server or browser based Web applications. RSI has extensive expertise customizing ESRI GIS mapping products as well third party application integration.

Company Background:

RSI is privately held with senior management and outside investors as the primary shareholders. It has maximized its capabilities by building key strategic relationships with other vendors to allow for an end product that is truly the result of the combined efforts of hundreds of individuals. Products are developed and designed by RSI and its partners and manufactured in state of the art facilities for guaranteed low cost and reliability. Installation and implementation is typically overseen by RSI staff at a client's site.



Experience



Miami-Dade County: Miami-Dade County has the largest population in Florida and the 8th largest in the United States. RSI is implementing a large countywide AVL system for several departments and agencies including Public Works, Building Inspectors, Neighborhood Compliance, Solid Waste, Fire, Consumer Services, Water, and Community Action. Using RSI's new ESRI ArcGIS Server based Web browser interface, county departments are able to better manage their mobile assets and provide improved customer service. With over 1300 vehicles installed, the system is constantly growing department by department.



City of Phoenix: RSI has installed a customized AVL and Mobile Data system to the City of Phoenix Department of Public Works. The system is equipped on the City's solid waste fleet and public works fleet of approximately 450 vehicles. Each vehicle is equipped with an RSI mobile unit as well as a customized Garmin unit that will be used for messaging as well as individual route navigation for the drivers. The system allows fleet administrators to monitor the vehicles in real time as well as view reports on vehicle activity such as speed and location of armature lifts. The messaging terminals give the drivers the ability to instantly mark/record locations where there is a damaged or missing container.



City of Houston: The City of Houston, Texas is the fourth largest city in the United States centered in a metro area of nearly 6 million residents. RSI currently has a city-wide contract for multiple departments including Solid Waste, Fire, Public Works, Parks & Recreation, and others. The Web browser based AVL system is accessible by the individual departments and used in their own unique ways. Some of the various departments even have different reports, mobile hardware, and system configuration customized for their own unique needs.



City of Ann Arbor: Ann Arbor, Michigan is home to the world renowned University of Michigan. With a metro area of over 340,000 residents, Ann Arbor is one of the most progressive and forward thinking cities in the Midwest. The City selected Radio Satellite Integrators to provide real time vehicle tracking for its city vehicles, including public works and snow removal vehicles. Residents are able to log on to the City website and view the location of the snow plows relative to their routes and homes. Leveraging a shared ESRI GIS technology, the city's snow plow routes are over-layed on the map display.



City of Tacoma: Just south of Seattle, Washington lies the City of Tacoma. With a population of 200,000 the City of Tacoma is the third largest city in the state. Through a competitive RFP process, the City of Tacoma selected Radio Satellite Integrators to provide a turn-key AVL system to provide GPS tracking capabilities for its Solid Waste division vehicles. RSI outfitted the City's solid waste vehicles with an AVL system that included sensors for tracking the automatic armature lifts and relating the data to the City's ESRI GIS map data and customer database.



City of Oklahoma City: The City of Oklahoma City has implemented an RSI AVL system over several departments including Water, Solid Waste, and Street Maintenance. Encompassing a wide variety of vehicles, the RSI AVL system provides different reports for different groups and vehicles. Some departments are using the RSI customized Garmin messaging terminal to provide instant communication between driver and dispatcher. In addition the RSI AVL system is tracking various sensor and events on certain vehicles such as lights, signs, and PTO activation.



City of Jacksonville: RSI has implemented a city-wide Automatic Vehicle Location system for the City of Jacksonville. The multi-agency system spans across several departments and various types of vehicle fleets including public works and various city agencies. Each department will have their own AVL interface to the system but will share some of the more expensive and transparent aspects of the system such as the communications backbone and centralized servers. The system is currently being expanded to additional city departments and agencies.



City of Fresno: RSI has implemented a full scale multi-agency AVL system for the City of Fresno. With a fast growing population around 1 million people in the greater metro area, the city looked to RSI to provide a customized AVL system for the Water, Sewer, and Planning agencies within the City. Spanning over 300 vehicles and dozens of computer workstations, the system is integrated with the City's extensive ESRI GIS mapping programs. The system has several key features including sensors on the sanitation vehicle loading arms.



Boston Water and Sewer Commission: RSI has implemented a turn-key Automatic Vehicle Location system for Boston Water and Sewer Commission. The (BWSC) currently operates water and sewer services for the City of Boston. RSI is implementing full end-to-end AVL system utilizing 2-way radio for wireless communications. With over 200 vehicles in the service fleet, the RSI AVL system uses a combination of ArcView and ArcGIS 9 for vehicle tracking using BWSC base maps.



New York City Transit

New York Metropolitan Transit Authority (MTA)- MTA's New York City Transit is responsible for public transportation throughout New York City, including subway and bus service. NYCT is the largest public transportation agency in North America and has a ridership of over 7 million trips daily and 2 billion trips annually. NYCT Revenue has a high security fleet of armored vehicles responsible for collecting and transporting the cash collected from the various ticket kiosks throughout the city. NYCT uses a highly customized RSI AVL system to track and manage this fleet of vehicles.



City of Miami Beach: Home to the glamorous area known as South Beach, the City of Miami Beach also includes nearly 90,000 residents who depend on the City for a variety of standard civil and municipal services. Encouraged by the overwhelming success of RSI's AVL system for local Miami-Dade County, Miami Beach selected RSI to provide a highly customized and integrated AVL system for



City vehicles. The RSI AVL system is able to leverage the advanced ESRI GIS mapping technology that the City has developed and uses in-house.



departments. The system uses existing city infrastructure for wireless data transmission (WiFi) that is collected when the vehicles enter various city facilities and yards.

City of Huntsville: With a metro area of over 400,000 residents Huntsville, Alabama needed an AVL solution to monitor its 800 city vehicles. Selected through a competitive RFP process, Radio Satellite Integrators won the contract and delivered a turn-key AVL system providing vehicle location software and reporting for various city

the AVL system are provided by Verizon Wireless.



Bernalillo County: Bernalillo County, New Mexico is the most populous county in the state with over 660,000 residents. With its seat as the City of Albuquerque, Bernalillo County needed a real-time AVL system to manage the hundreds of vehicles the County operates. The County selected RSI after a thorough and competitive RFP process. The RSI AVL system tracks hundreds of county vehicles including public works and sheriffs cruisers. Wireless data services for



GFI GenFare fare box and also prompts the on-board headsigns and annunciators.

Dallas Area Rapid Transit (DART): Dallas Area Rapid Transit (DART) serves Dallas and 12 surrounding cities with public transportation including rail and bus services. The DART network of services moves more than 200,000 passengers per day across the 700-square-mile service area. Each of the 800 DART buses is installed with the RSI V-Track™ unit. Each V-Track™ unit is interfaced with a



data for the fleet of technician, supervisor, meter reader, emergency, and other operations vehicles.

Erie County Water Authority: The Erie County Water Authority (ECWA) is responsible for the upkeep and supply of water to 640,000 residents in the greater Buffalo, NY area. Using the RSI AVL system and Kenwood two-way radios, the ECWA is able to track and monitor its fleet for a variety of dispatching, supervisory, and security uses. Viewed on RSI's powerful mapping software, ECWA administration can see detailed real-time and archived location



communications.

Town of Mansfield Public Works: The Town of Mansfield, Connecticut is located in the northeast corner of the state of Connecticut. With a population of 21,000 covering 45 square miles, public works are just as important to this small town as they are to any city, especially with their harsh winters. Mansfield has the RSI AVL system in their multi-use public works vehicles for snow plowing, spreading, salting, sanding, and various public works duties. The system uses a public data network for wireless



State of South Carolina- Department of Education: RSI is currently installing a state-wide AVL system for the State of South Carolina DOE that will encompass 6000 school buses across the state. The State owns all 6000 school buses and is going to use the RSI AVL system to insure the districts are operating



and reporting on the buses in a satisfactory manner. Some of the several dozen school districts will have the option to use the AVL system for their own operations if desired. The RSI system will track virtually every device and sensor imaginable on each bus including doors, lights, arms, emergency exits, etc.



Richland County, SC: Richland County is home to the state capitol of Columbia and is the second most populous county in South Carolina with approximately 340,000 people. The RSI AVL System will provide county-wide GPS tracking of their vehicles, concentrating on their public works fleets. The RSI AVL system combines GPS, two-way radio, and customized mapping software to provide real-time vehicle fleet location data to dispatchers and administrators. The AVL project was spearheaded by the County’s GIS (Geographic Information Systems) department, who selected RSI based on several factors including RSI’s expertise in using ESRI ArcGIS 9 software.



British Petroleum (BP America Production Company): RSI has implemented the first phase of a highly customized AVL system for a set of BP’s vehicles that maintain wellheads in various remote areas of the southwest United States. Often times off paved roads or out of cellular coverage, the RSI AVL system uses a highly rugged hybrid mobile unit that can switch between cellular and satellite communications networks. These irregular conditions made it imperative that the system utilize BP’s actual ESRI GIS map data as well guaranteed wireless communications. The system also incorporates multiple emergency panic buttons including a wireless handheld panic button that can be relayed via satellite when necessary.



St. Lucie County Fire Rescue: Radio Satellite Integrators has been selected by the St. Lucie County Fire Rescue to implement a fully integrated Automatic Vehicle Location (AVL) and mobile data system. The turn-key system will include 43 of the District’s fire rescue vehicles and operate over a standard 2-way radio system that covers the entire county. The system will also include fully ruggedized Mobile Data Computers running RSI’s SPOT (Site Preplan On-board Technology) mobile fire response software. The AVL system will be integrated with the existing CAD system from HTE Inc.



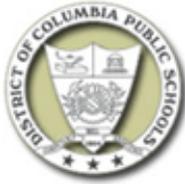
City of Visalia – Department of Public Works: Located in California’s San Joaquin Valley, the City of Visalia is a central hub for the state’s thriving agricultural industry and home to more than 123,000 people. As one of the fastest growing cities in the country, Visalia needed help managing its fleet of public works and solid waste vehicles. Using a combination of RSI AVL and ESRI ArcGIS, the city can monitor and manage vehicle fleet activity to improve operational efficiency as well as customer service.



Hawaii County Mass Transit: Based in Hilo on the Big Island of Hawaii, The Hele-On buses run by Hawaii County Mass Transit provides public transportation all around the island servicing approximately 400,000 passengers per year. RSI has provided Hawaii County Mass Transit an AVL and Mobile Data Terminal System allowing administrators to track as well as communicate with the buses in real time using a Web based interface. RSI’s newly updated



Web based AVL interface uses ESRI ArcGIS Server as the underlying mapping engine for the AVL map interface.



District of Columbia Public Schools: As the local school district for our nation's capitol in Washington D.C., DCPS faces unique challenges in transporting its students throughout the year. In order to optimize the operation of nearly 800 school buses over this sprawling urban city, DCPS enlisted the help of vehicle tracking and routing technologies from Radio Satellite Integrators and the Trapeze Group. RSI and Trapeze were brought in to immediately take over and replace a competitor's routing and AVL solution that was not meeting the District's needs. The new integrated solution now provides valuable operational data such as planned versus actual route performance as well as door and light/arm activity on the buses.



City of Tampa Fire Rescue: RSI implemented a complete AVL and Mobile Data system for the City of Tampa, Florida. The system operates over existing Tampa frequencies and towers, and is fully integrated to the Astra CAD system running on an IBM AS/400 system. RSI was able to implement its SmartSlot technology utilizing GPS time synchronization which allows for vehicle updates as fast as 5 per second using the City's existing Ericsson voice radios and allocated voice frequencies. Another critical project component was interfacing to the City's Computer Aided Dispatch (CAD) system from Astra software of North Carolina.



Horry County, SC: Horry County is located on the eastern most tip of the South Carolina coast and is home to the popular tourist destination city of Myrtle Beach. The Horry County government is currently implementing a multi-department AVL system for various fleets and agencies within the County. After witnessing the overwhelming success of the RSI AVL system in nearby Richland County, Horry County procured a system of their own.



CEMIG: Supplying energy to 17 million people, CEMIG is Brazil's largest electric utility company and one of the largest in all of Latin America. CEMIG covers the State of Minas Gerais expanding 560,000 square kilometers, which is equivalent in size to the entire country of France. To efficiently manage a utility workforce that can service this entire state requires a complex yet cost-effective logistical solution. In order to take on this gargantuan task, CEMIG contracted Radio Satellite Integrators to implement an AVL and mobile data system utilizing their existing E.F. Johnson MultiNet Trunking radio system. The initial phase of the project encompasses 400 of CEMIG's 2000 vehicles.



Chugach Electric Association: Based in Anchorage, Alaska, the Chugach Electric Association provides power and electrical services to over 81,000 retail customers in the state of Alaska. The Chugach Electric Association ranks among the largest of the more than 900 electric cooperatives in the country. Utilizing RSI's AVL system, Chugach Electric is able to monitor their vehicle fleet in relation their own ESRI GIS data and infrastructure.



References

City of Houston

Houston, TX

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SitcawichRJ@BWSC.ORG

Richland County

Columbia, SC USA

Phone: 803-576-2017

Contact: Brian Fitzgerald

brianf@rcgov.us

City of Torrance

Torrance, CA USA

Phone: 310-781-7008

Contact: John Kohler

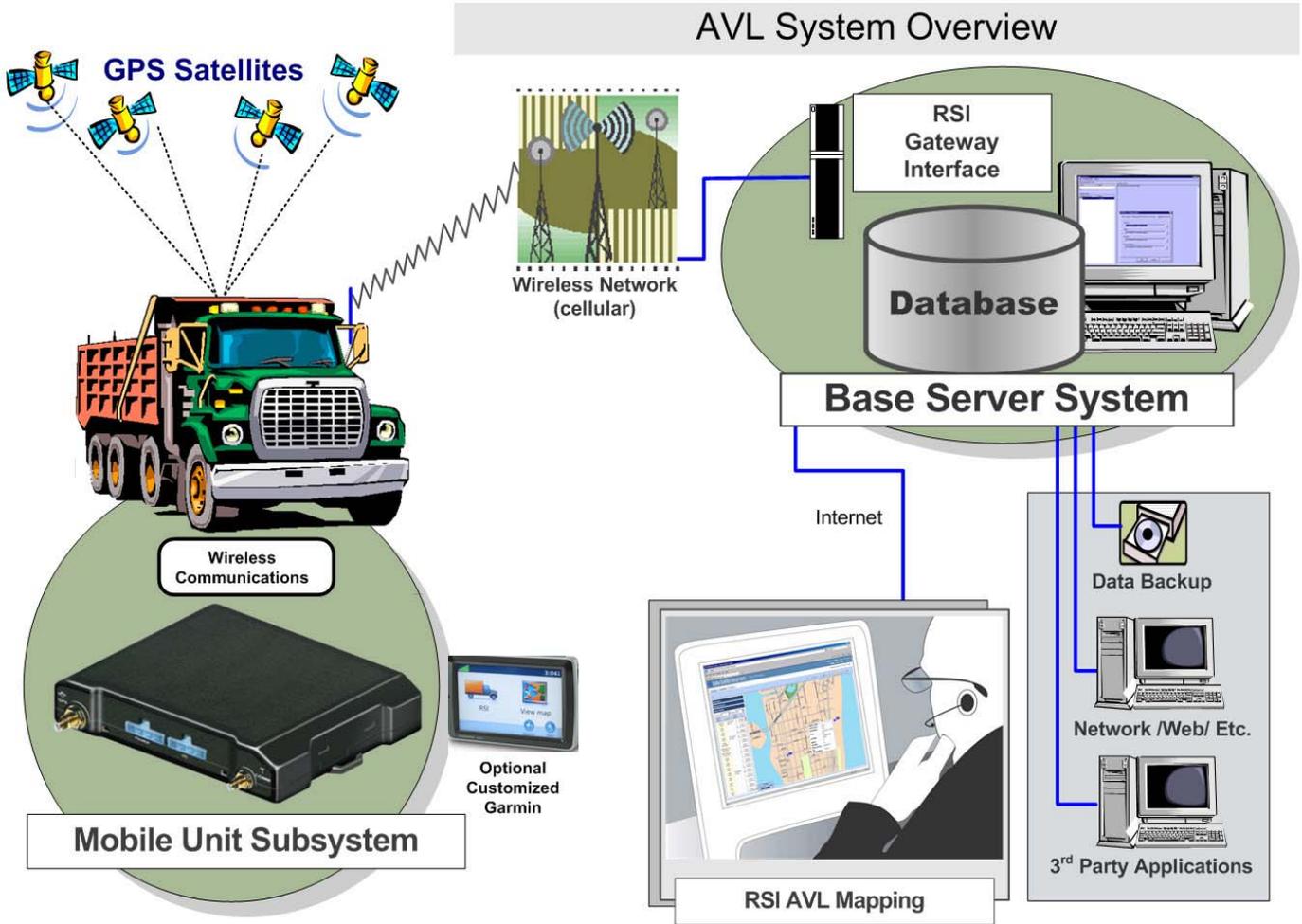
jkohler@torrnet.com

Question	Vendor Response
Official Name of Company	Radio Satellite Integrators
Headquarters' Address	19144 Van Ness Ave. Torrance, CA
Telephone Number	310-787-7700 90501
Fax Number	310-787-7435
Federal Tax ID Number	33-0477102
Names under which the business has operated within the last 10 years.	
Contact Name for questions concerning RFP response.	Brett Lim, Director of Marketing
Contact's Telephone Number	310-787-7700
Contact's e-mail address	blim@radsat.com
Is company authorized and/or licensed to do business in the State of New York?	YES or NO YES
Does your company have an office in the City of Rochester or County of Monroe?	YES or NO NO
Company Ownership	Public or Private PRIVATE
If Private, list primary owners and their percentage ownership.	Jonathan Michels 50% Brian Burda 50%
If Public, list stock trading symbol and market which it is traded.	
Has corporate ownership changed in the last 5 years? If so, provide details.	YES or NO NO

Question	Vendor Response
Has the company purchased any other companies or divisions of companies in the last 5 years? If so, provide details.	YES or NO NO
Has the company or any of its principals defaulted on any municipal contracts in the past 5 years? If so, provide details.	YES or NO NO
Please provide details on any lawsuits involving the company that are currently pending or occurred in the past 5 years.	NONE
Has your company ever been declared bankrupt or filed for protection from creditors under state or federal proceedings? If so, state the date, court, jurisdiction, amount of liabilities and amount of assets.	YES or NO NO
Is your Company currently on the approved NYS Contract list? If yes, identify contract services.	YES or NO NO



Technical Overview



Radio Satellite Integrator's AVL System

An RSI AVL solution consists of in-vehicle equipment and base applications and equipment. The **In-Vehicle Equipment is centered on the RSI Mobile Unit**, a self-contained "black box" device integrating GPS location and sensor technologies, as well as wireless communications. The mobile device can be connected to any device or sensor including lights, ignition, doors open/closed, alarms, etc. In addition, any variety of in-vehicle computing devices such as laptops or MDT's can be connected to the unit and mounted for a driver interface to the system.

The Mobile unit is responsible for the reporting of vehicle location and status information in addition to acting, if desired in the future, as a transparent communications gateway between the Base and Mobile Data or other onboard devices such as alarms, etc.



The **Base Application** will be a configurable Web-browser based application based on ESRI ArcGIS Server hosted offsite by RSI. Users interact with the system through industry-standard mapping tools as well as customized reporting applications. The RSI AVL program will use the client's existing ESRI GIS map data if it's available.

The Base Server manages all fleet communications and configuration, acts as a messaging and data transfer gateway between base-side applications and in-vehicle devices, and archives and distributes the vehicle location and status information to the mapping application over the Internet. The Base Server will be hosted by RSI in our state-of-the-art server hosting facilities.

The screenshot displays the RSI AVL Web Tracking application. The interface includes a navigation menu with 'TRACKING', 'MESSAGES', and 'ALERTS'. A table on the left lists vehicle data, and a popup window shows details for vehicle 70541.

VEHICLE GROUP	LOCATION	SPEED	HEADING	TIME
110365 (B Tractor)	10886 SW 76TH TER 33173	0	N	4/11/2012 11:51:13 AM
110360 (B Tractor)	5W 79TH ST 33173	0	E	4/11/2012 11:06:15 AM
110391 (B Tractor)	10948 SW 76TH ST 33173	0	W	4/11/2012 11:20:55 AM
110392 (B Tractor)	RAAM DIVISION	10	SW	4/11/2012 12:41:20 PM
110383 (B Tractor)	7563 SW 100TH AVE 33173	0	N	4/11/2012 11:04:46 AM
110394 (B Tractor)	11120 SW 80TH ST 33173	0	N	4/11/2012 2:28:34 PM
110395 (B Tractor)		0	N	4/11/2012 9:00:07 AM
110401 (B Tractor)	10882 SW 76TH TER 33173	0	N	4/11/2012 11:04:09 AM
110492 (B Tractor)	8201 SW 90TH CT 33173	04	SW	4/11/2012 2:36:34 PM
110483 (B Tractor)	11152 SW 80TH ST 33173	0	E	4/10/2012 10:46:48 AM
1167A (Garbage Sg 1)	6180 SW 82TH AVE 33173	0	N	4/11/2012 11:42:20 AM

Vehicle: 70541
Vehicle Name: 70541
Group Name: Trash Trucks
Time: 4/11/2012 2:24:53 PM
Time Fix: 4/11/2012 2:24:53 PM
Location: 485 NW 88TH ST 33150
Landmark:
Speed: 3
Heading: S
Status/Events: Ignition On
Age (dd:hh:mm:ss): 0:00:01:06
VIN/ID:
License/TAG:
GPS Status: 3D [00,00,008]



Wireless Communications Options

RSI has worked with more communications technologies in our 20+ years of technology leadership than any other vendor in this marketplace.

There are several options for wireless communications and RSI is proficient with all of them.

<p>Public Data Network (Cellular)</p>	<ul style="list-style-type: none"> • GPRS/GSM/EDGE (AT&T, T-Mobile, Rogers, etc.) • CDMA/EV-DO/1xRTT (Verizon, Alltel, etc.) • Others: Sprint/Nextel/iDEN/ • High Speed Broadband Networks (3G/4G)
<p>Other Options (hybrid communications)</p>	<ul style="list-style-type: none"> • WiFi (802.11) • Satellite (Iridium, Inmarsat, etc.) • Two-way radio (AVL data dedicated systems)

- **RSI can use virtually any wireless carrier for the communications portion of this system. We are proposing AT&T GPRS as a default standard. [Verizon/Sprint CDMA is available as an option.](#)**

Hybrid Communications Option

RSI specializes in engineering customized AVL systems that can use a combination of wireless communications technologies. Our mobile units can support any combination of: cellular, satellite, two-way radio, WiFi, as several others. RSI has unparalleled experience in the design and implementation of these complicated customized hybrid systems.



Public Data Network Options

The recommended and most cost efficient means to send wireless data is through a cellular or public data network. Public data networks are wireless data networks that are provided by all the major cellular phone companies. The wireless data networks generally have the same coverage areas as their voice and mobile phone coverage areas.

Wireless Carriers

RSI has partnerships and capabilities with every major wireless carrier. Choosing a carrier depends on several factors including availability in your area, quality of coverage, rate plans, and existing contracts/discounts. Some technologies have higher upfront equipment costs but lower data plans, and vice versa.

Update Rate

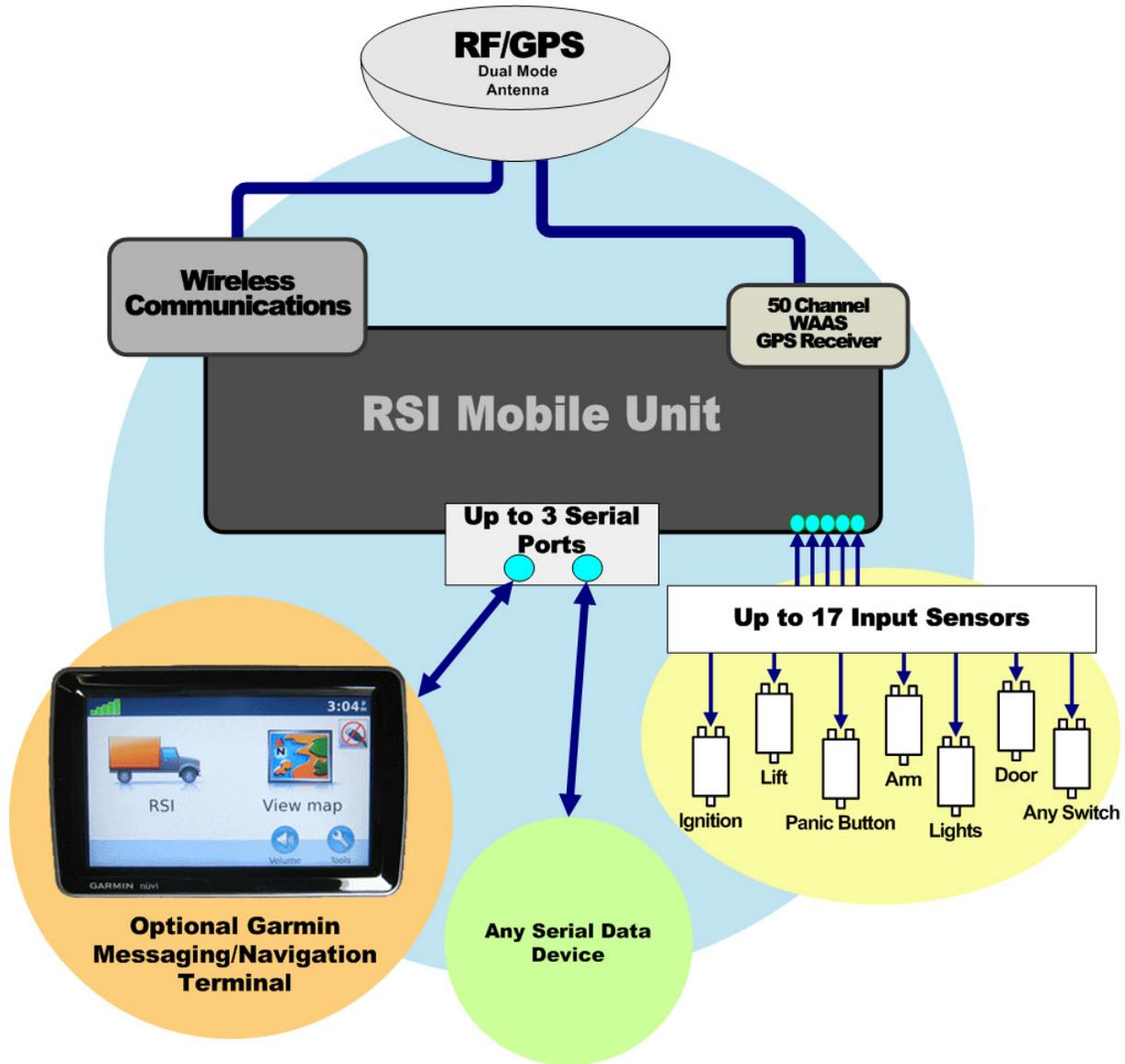
The update rate you need will depend on how frequently you want your location and other data from the vehicles. Update rates can adjust dynamically depending on factors such as vehicle status or the triggering of an on-board sensor.

RSI will work with you to help determine a wireless technology, carrier, and update rate for you as we have extensive experience implementing AVL systems with fleets just like yours.

We typically recommend a one minute or thirty second update rate. The Unit will report at this default reporting rate **in addition** to the position/status data sent upon: ignition on/off, stops, starts, turns, and events.



RSI Mobile Unit





RSI Mobile Unit

The recommended RSI Mobile Subsystem consists of a RSI Mobile Unit; GPS and RF antennas and associated cabling; all required data, sensor, and power connections.

Each RSI Mobile Unit contains a 50 channel GPS receiver (or greater), wireless communications, and multiple external data and sensor ports. To ensure reliability and availability of the entire system, the critical mobile units are built to exacting military standards to resist vibration, climate, and electromagnetic interference. First-quality components, extensive RF/EMI shielding, and specialty power conditioning circuits protect the GPS receiver and micro-controller in the “computer hostile” vehicular environment.

Each RSI Mobile Unit will be equipped with a state-of-the-art 50 channel, WAAS enabled, all-in-view GPS receiver. This GPS receiver delivers superior performance and field-proven reliability and provides for fast signal reacquisition, position accuracy, and the filtering of spurious and erroneous data. The GPS accuracy is 2 meters (7 feet).

RSI is offering two types of mobile units with similar functionality that support different amounts of inputs/outputs: up to 5 (standard) and up to 17 (optional).



Interface to Devices and Sensors

The RSI Mobile Unit is capable of interfacing to a wide variety of external mobile data terminals, mobile computing devices, in-vehicle peripherals, and various sensor systems. The RSI Mobile Unit serves as a mobile gateway, paying particular attention to supporting a variety of devices. The RSI Mobile Unit will be connected to the on-board vehicle power and any sensor signals as desired such as:

- Ignition on/off
- Door open/locked
- Lights on/off
- Any device/event/switch/data source
 - Armature/device up/down
 - RF ID or Card Swipe Reader
 - Vehicle Engine Diagnostics
 - Brooms/Plows/Spreaders
 - Landmarking
 - Siren/Light Bar/Flashers
 - PTO
 - Etc.

Vehicle Diagnostics Option

As an option, an interface to engine diagnostics can be added to the RSI AVL system giving you real-time access to engine trouble codes and other vehicle information for either light duty or heavy duty vehicle types.

Panic Button Feature

The RSI Mobile Unit can be equipped with an emergency panic button configuration that is a dashboard-mounted button that sends a priority signal over-the-air to the dispatch interface or real-time alert. RSI can also offer a wireless handheld panic button that can be activated up to 300 feet from the vehicle.

Antennas, Cables, and Connectors

The GPS/RF antenna is typically an active low-profile micro-strip, two-in-one “hockey-puck” type and is connected to the RSI Mobile Unit with low-loss coaxial cable. The high gain antenna increases the ability for the GPS to receive weak signals under trees or canopy, while its very small design presents little or no profile for tampering or inadvertent damage. The RSI Mobile Unit can use any type of GPS antenna that is required or specified. The RSI Mobile Unit comes with all bracketing, cabling, and connectors required for full installation. RSI configures the system so it cannot be easily disabled by the driver and/or user.



RSI Mobile Unit (5 I/O)



- GSM/GPRS or CDMA 1xRTT radio configurations
- Internal or External Cellular and GPS antenna options for easy installation
- High Sensitivity GPS
- 3-Axis Precision Accelerometer
- 20,000 Buffered Message Log
- 32 Geo-fence capability
- 5 Inputs/3 Outputs/1-wire® Interface for Driver ID, Temperature Sensors, and more.
- Dual serial ports
- Garmin® FMI support
- Power management sleep modes
- Automatic, over-the-air configuration, firmware download, and device management

Communication Specifications

GSM/GPRS Quad-Band	850/900/1800/1900 MHz
GSM/GPRS Output Power	850: 2 Watts (Class 4)
	900: 2 Watts (Class 4)
	1800: 1 Watt (Class 1)
	1900: 1 Watt (Class 1)
CDMA Dual-Band	800/1900 MHz
CDMA Output Power	800: +24 dBm
	1900: +24 dBm
Data Support	SMS, GPRS or CDMA 1xRTT packet data

Certifications

Fully certified FCC, CE, IC, PTCRB, Cellular Carriers

Location Specifications

Location Technology	50 Channel GPS
	SBAS: WAAS, EGNOS, MSAS
Location Accuracy	2.0 meter CEP (with SBAS)
Tracking Sensitivity	-162 dBm
Acquisition Sensitivity	-147 dBm
AGPS capable	

Comprehensive I/O

Inputs	5 (2 fixed bias low, 3 fixed bias high)
Outputs	3 Relay Driver (150 mA)
Serial Interfaces	2 (1 TTL serial, 1 switched power TTL)
A/D Inputs	2 (1 internal, 1 external)
1-Wire® Interface	Driver ID
	Temperature Sense
Status LEDs	GPS and Cellular

Connectors, SIM Access

I/O, Power, Programming	20-pin Molex-type fused power harness
GPS Antenna	External SMA (w/ tamper monitoring, 3V) or Internal
Cellular Antenna	External SMC or Internal
SIM Access	Internal (GSM/GPRS variant only)

Electrical Specifications

Operating Voltage	6-32 VDC
Power Consumption	<3 mA @ 12 V (Deep Sleep)
	<10 mA @ 12 V (Sleep on Network with SMS)
	<20 mA @ 12 V (Sleep on Network with GPRS)
	< 70 mA @ 12 V (Active Tracking)

Physical Specifications

Dimensions	2.0 x 4.0 x 0.85 inches (51 x 102 x 22 mm)
Weight	74 g (external), 85 g (internal)

Environmental Specifications

Operating Temperature	-30° to +75° C
Storage Temperature	-40° to +85° C
Humidity	95% R.H. @ 70° C non-condensing
Shock and Vibration	U.S. Mil. Std. 202G and 810F, SAE J1455
EMC/EMI:	SAE J1113

Mounting

Tie-wrap, Adhesive, or Velcro
Screw Mounting Bracket

Optional Features/Functions

- Driver ID with 1-Wire® protocol
- Temperature Sensing via 1-Wire® protocol
- Backup Battery
- External GPS and Cellular Antennas
- Internal GPS and Cellular Antennas
- NMEA data via serial
- External A/D input
- Serial Cables
- jPOD™ truck ECU interface
- Garmin® FMI compatible interface cable
- Piezo speaker, panic button, and privacy button
- Power harness with two (2) 3A Fuses

Specifications Subject to Change.



RSI Mobile Unit (17 I/O)



- GSM/GPRS, CDMA 1X, or HSPA cellular configurations
- Dual reporting 20,000 buffered message log
- Built-in 3-axis accelerometer for motion sensing, hard braking, impact detection
- 32 built-in Geo-Zones, plus any combination of circle or polygon zones, up to 5400 points
- Web-Based Device Management diagnostic tools
- Garmin, MDT, and other advanced peripherals support

Location Specifications

Location Technology	50 Channel GPS (with SBAS) SBAS: WAAS, EGNOS, MSAS, GAGAN
Location Accuracy	2.0 meter CEP (with SBAS)
Tracking Sensitivity	-160dBm
Acquisition Sensitivity	-147dBm
Kick Start	3 Sec @ -130dBm
AGPS capable	

Communications Specifications

Data Support	SMS, GPRS (UDP), CDMA 1X packet data
Cellular/PCS:	FCC– Parts 22, 24; PTCRB
GPRS	Up to class 12
GPRS Quad-Band	850/900/1800/1900 MHz
CDMA Dual-Band	800/1900 MHz
HSPA/UMTS Tri-Band	850/1800/1900 MHz HSUPA 2.0 Mbps HSDPA 7.2 Mbps

Comprehensive I/O

Ignition Input	1
Inputs	7 (high/low selectable 0-30 VDC)
Outputs	5 (open collector relay 150mA)
Current Limited Outputs	2 (20mA)
A/D Inputs	4 (0 - 30VDC, +/-0.1V accuracy)
1-Wire® Interface	Driver ID Temperature Sense
Status LEDs	GPS and Cellular

Optional Features (with add-in daughter boards)

WiFi	802.11b/g/i
jPOD Truck ECU Interface	J1708, J1939

Certifications

Fully certified FCC, CE, IC, PTCRB, CARRIERS

Electrical Specifications

Operating Voltage	6 - 32V DC
Power consumption	< 4 mA @ 12VDC (Deep Sleep) < 10 mA @ 12VDC (Sleep on Network (SMS)) < 20 mA @ 12VDC (Sleep on Network (GPRS)) < 70 mA @ 12VDC (Active Tracking)

Physical Specifications

Dimensions	4.3 (L) x 3.2 (W) x 0.86" (H), (110 x 81 x 22mm)
Weight	4 oz, (113 g)

Environmental Specifications

Temperature	-30° C to 70° C (Operating), -40° C to 85° C (Storage)
Humidity	95% RH @ 50° C non-condensing
Shock and Vibration	U.S. Military Standard 202G and 810G, SAE J1455
EMC/EMI	SAE J1113

Connectors, SIM Access

SIM Access	Internal
External Cellular	SMC
External GPS	SMA (with tamper monitoring, 3.0v)
WiFi option	RP-SMA
Vehicle Bus option	DB-15
4-Pin Molex	Power, Ground, Ignition, A/D
2 5-Pin Molex	Switched Power Serial
16-Pin Molex	Expansion port
22-Pin Molex	I/O connection

Optional Features/Functions

- External antennas (GPS, cellular, combined GPS/cellular)
- Serial adapter cable RS-232 8-wire (PPP, AT Commands, NMEA GPS output)
- jPOD dongle for truck ECU interface
- Connectorized I/O wiring harnesses

Specifications subject to change



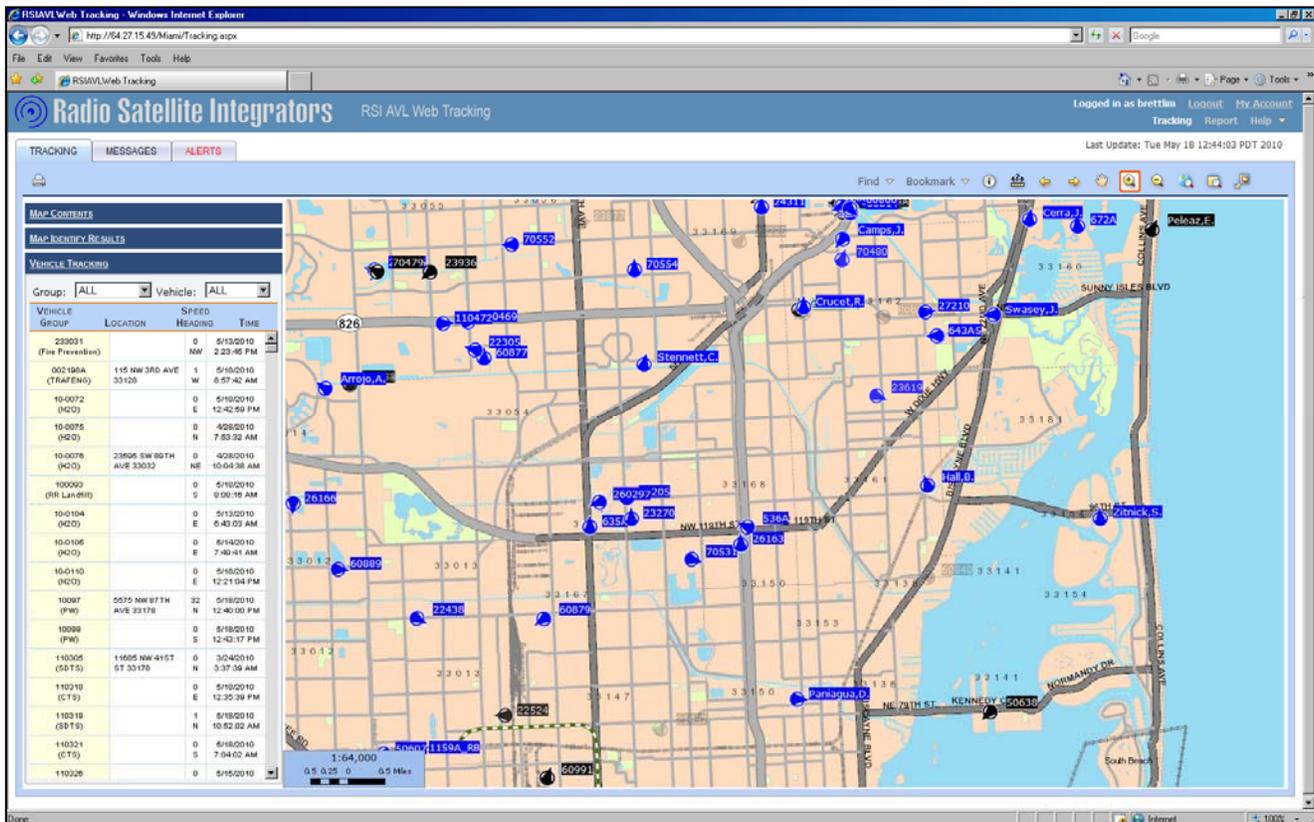
Mapping and Display Application

Our powerful mapping and display application, RSI AVL, will provide operations personnel the capability to rapidly, geographically analyze the GPS information and make critical decisions. This application is based on an [ESRI ArcGIS Server](#) Geographic Information System (GIS), which displays data collected from the mobile units at the Base Server. They run the tools and controls that enable the operations personnel to quickly adapt the information they are collecting and analyzing the views they are using to manage evolving situations.

The Mapping and Display Application provides valuable AVL Management tools:

- Real-Time Vehicle Tracking (map-based)
- Report Generation (tabular or map-based)

The assignment of user-permission levels allows access to appropriate sub-sets of the installed functionality.



Note: Your user interface will differ depending on customized configuration and preferences.



Real-Time Vehicle Tracking

The RSI AVL Application displays the current location and status of the vehicle fleet, along with address, route, and other attribute information, over both raster and vector-based maps (as desired). The use of a powerful ESRI ArcGIS Server engine along with the incorporation of vector map data allows for almost endless display and analysis possibilities. A wide variety of customizable functionality is available and is described below.

The vehicle icons may be configured to indicate (using colors, directional symbols, labels, and size) various vehicle attributes (such as ID, status, speed, heading, etc.). All of the vehicle attribute data may be instantly queried and displayed in a pop-up box using a standard identify tool. Further, alarm and event notification may be set to notify the user of a status change for a particular vehicle.

Map Contents

Map Identify Results

VEHICLE TRACKING

Group: ALL Vehicle: ALL

VEHICLE GROUP	LOCATION	SPEED	TIME
Dump BYD (RAAM)	19779 SW 80TH TER 33173	0	8/17/2010 6:57:46 AM
10-0072 (H2O)		0	7/21/2010 1:35:29 PM
10-0075 (H2O)		0	8/11/2010 10:57:59 AM
10-0078 (H2O)	23698 SW 80TH AVE 33032	0	7/13/2010 7:16:00 AM
100093 (RR Landfill)		0	7/12/2010 2:02:26 PM
100100 Patch Truck (Patch Crew)		0	7/21/2010 10:46:35 AM
100110 Patch Truck (Patch Crew)		0	7/21/2010 1:02:26 PM
10-0104 (H2O)		0	7/20/2010 10:31:46 AM
10-0105 (H2O)		0	7/20/2010 6:31:46 AM
10-0110 (H2O)		0	7/21/2010 11:19:47 AM
110305 (SST5)	7370 MM 40RD ST 33166	0	8/15/2010 12:52:23 PM
110318 (CT5)		0	7/21/2010 10:36:15 AM
110319 (SST5)		0	7/21/2010 10:36:18 AM
110321 (CT5)		0	7/20/2010 12:05:38 PM
110326 (CT5)		0	7/20/2010 12:10:24 PM

Vehicle: 26196

Vehicle Name: 26196
 Group Name: PTRD
 Time: 7/21/2010 1:34:09 PM
 Location: 10 LINCOLN RD 33139
 Speed: 0
 Heading: W
 Status/Events: Ignition On
 Age (DD:HH:MM:SS): 0:0:0:4

Clicking on a vehicle from the menu bar list will reveal more options for that specific vehicle.



Map Viewing Features

The RSI AVL Application displays the vehicle data in a “map window.” The map window can be set to display a particular area, route, stop, or address, or to track a specific sub-set of the entire fleet (from the entire fleet to an individual vehicle). In RSI AVL the map display window possesses a full-set of map manipulation and query functionality. Map manipulation tools and buttons are available to zoom, pan, and center the display on a particular vehicle, route, stop, or address. Additional tools are available to enable or disable labeling, to customize the map display according to user preferences, and to enter points and attributes (for incidents, etc.). Map query options include the ability to locate an address, vehicle, or stop, along with the capability to identify the closest available vehicle(s) to any entered point, address, or incident.

GeoFencing

The RSI AVL system allows the user to set geo-fences on the map display. This geofence will create an alert and/or exception when breached and will appear as another item of status data with each vehicle position report. Geofences can be created as polygons or a configurable radius from a specific point, as well as created from existing boundaries, landmarks or zones within your GIS.

Radio Satellite Integrators RSI AVL Web Tracking

Logged in as rsadmin | Logout | My Account
 Tracking | Report | Admin | Help

Last Update: Wed Jul 21 13:34:27 PDT 2010

Find | Bookmark | 100%

MAP CONTENTS

MAP IDENTIFY RESULTS

VEHICLE TRACKING

Group: ALL | Vehicle: ALL

VEHICLE GROUP	LOCATION	SPEED	HEADING	TIME
Dump #1D (RAM)	10779 SW 80TH TER 33173	0	N	6/17/2010 6:57:40 AM
10-0072 (HG2)		0	NE	7/21/2010 1:33:29 PM
10-0075 (HG2)		0	NW	6/11/2010 10:57:59 AM
10-0076 (HG2)	23506 SW 89TH AVE 33032	0	NW	7/13/2010 7:16:00 AM
100093 (PR Landfill)		0	W	7/12/2010 2:02:29 PM
100100 Patch Truck (Patch Crew)		0	N	7/21/2010 10:46:35 AM
100101 Patch Truck (Patch Crew)		0	NE	7/21/2010 1:03:25 PM
10-0104 (HG2)		0	E	7/20/2010 10:31:49 AM
10-0108 (HG2)		0	E	7/20/2010 6:31:49 AM
10-0110 (HG2)		0	NE	7/21/2010 11:19:47 AM
110305 (SPTS)	7370 NW 43RD ST 33166	0	NW	6/15/2010 12:52:23 PM
110316 (CTS)		0	S	7/21/2010 10:36:15 AM
110319 (SPTS)		0	S	7/21/2010 10:36:15 AM
110321 (CTS)		0	S	7/20/2010 12:08:28 PM
110326 (CTS)		0	S	7/20/2010 12:10:24 PM

Vehicle: 26198

Vehicle Name: 26198
 Group Name: PTRD
 Time: 7/21/2010 1:33:38 PM
 Location: 1644 ALTON RD 33139
 Speed: 14
 Heading: S
 Status/Events: Ignition On
 Age (DD:HH:MM:SS): 0:0:0:4



Real-Time Alerts

The RSI AVL system allows authorized administrators extensive control over system features including alerts and alarms. The system can be configured to notify selected users when specific events occur with any of the vehicles. This includes geofences, hours of operation, idle, panic buttons, etc. Notifications can be sent as an e-mail, SMS, or to the alert screen on the software.

VEHICLE	ALERT TEXT	DATE
20333 [x] ▲ 0644030 (WasteWater)	Depart Geofence Line Maintenance	2/1/2011 5:17:16 PM
20332 [x] ▲ 0644030 (WasteWater)	Arrive Geofence Line Maintenance	2/1/2011 5:02:59 PM
20330 [x] ▲ 0244202 (WasteWater)	Arrive Geofence Line Maintenance	2/1/2011 1:23:46 PM
20331 [x] ▲ 0933275 (Water)	Arrive Geofence Line Maintenance	2/1/2011 1:23:23 PM
20329 [x] ▲ 0831445 (Bulky)	Depart Geofence Solid Waste Management	1/21/2011 6:50:30 AM



ESRI

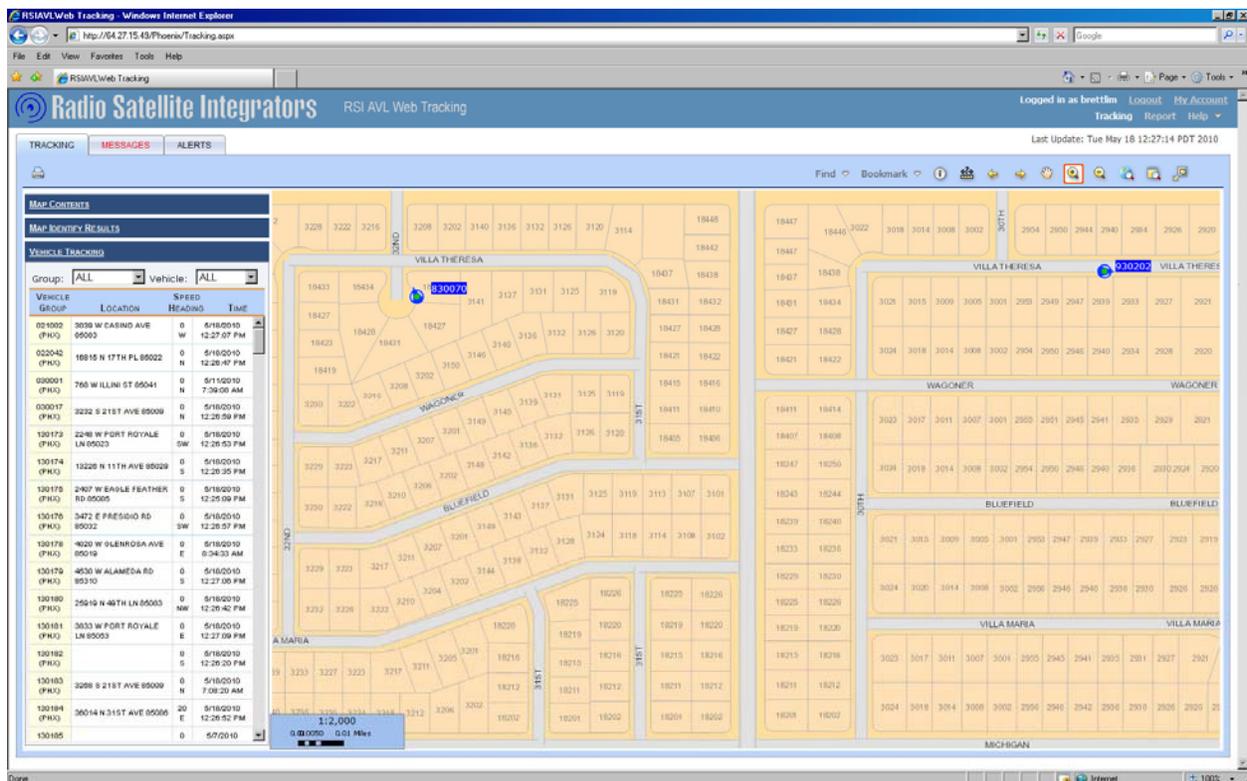
The RSI AVL Mapping application is based on mapping and GIS engines from ESRI, the largest GIS software vendor in the world, and a pioneer of the technology. Their systems are in use throughout the world by utilities, governments, and large companies, in thousands of applications, which rely on analysis of spatially referenced data. RSI AVL was the first system in the world to implement a real-time GPS interface into ArcView. The RSI AVL application is based on the actual ESRI ArcGIS Server software, but no licenses are needed by the customer.



**AUTHORIZED
BUSINESS PARTNER**

Using YOUR Map Data

The RSI AVL system can use virtually any type of map data, but in particular our software can overlay our AVL information on your own ESRI GIS maps. RSI allows you to utilize your existing investment of time and labor that went into your ESRI map data. The RSI AVL system relates real-time vehicle location and status data to the infrastructure, assets, boundaries, updates, routes, parcels, landmarks, and other critical elements of your constantly changing GIS map data. RSI has extensive experience working with ESRI data and environments in all forms (.shp files, SDE, etc.). As an option, RSI can actually access your GIS map data in real time via Map Services.

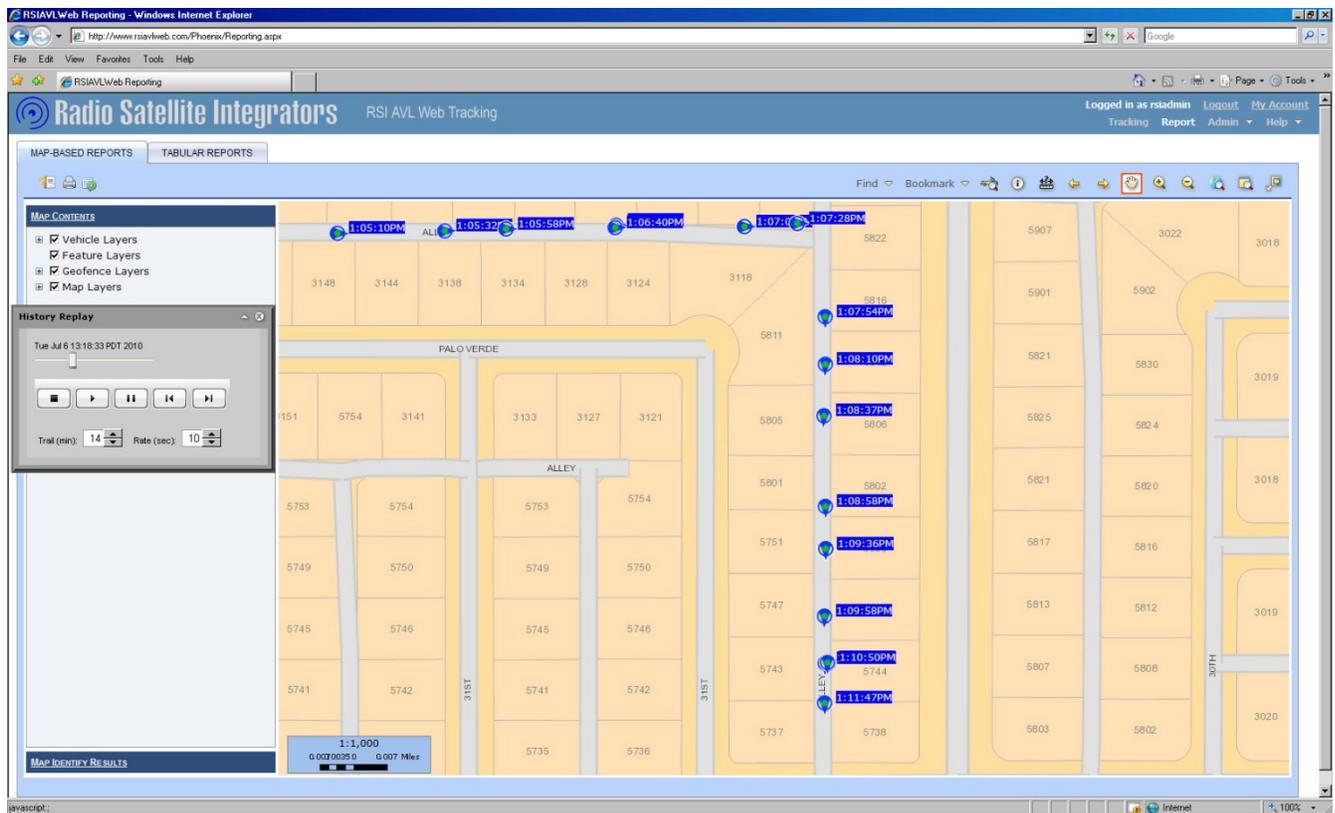




Leveraging GIS Technology

Because Radio Satellite Integrators uses a powerful ESRI GIS as the basis for both display and analysis, operations has the capability to perform complex “spatial query” analysis that capitalizes on the geographic referencing or correlation of the GPS location and velocity data collected with the base map. Our use of vectorized maps allows the user to analyze space and time components in entirety. Query capabilities are virtually unlimited. For example, RSI AVL includes a unique algorithm developed by RSI, which selects and recommends a vehicle for dispatch based on real-time location.

All of the real-time tracking functionality is available through the menus, buttons, and tools of the graphical user interface (which is easily customized to accommodate specific desires and requirements).

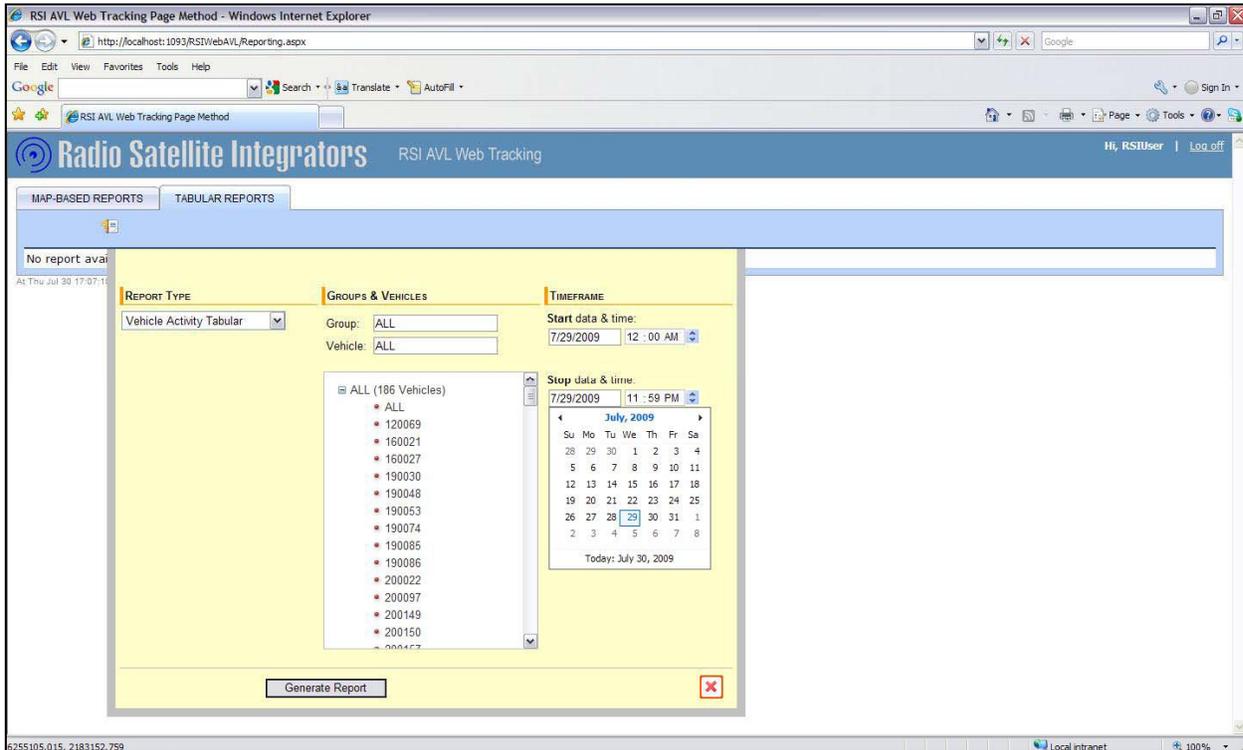


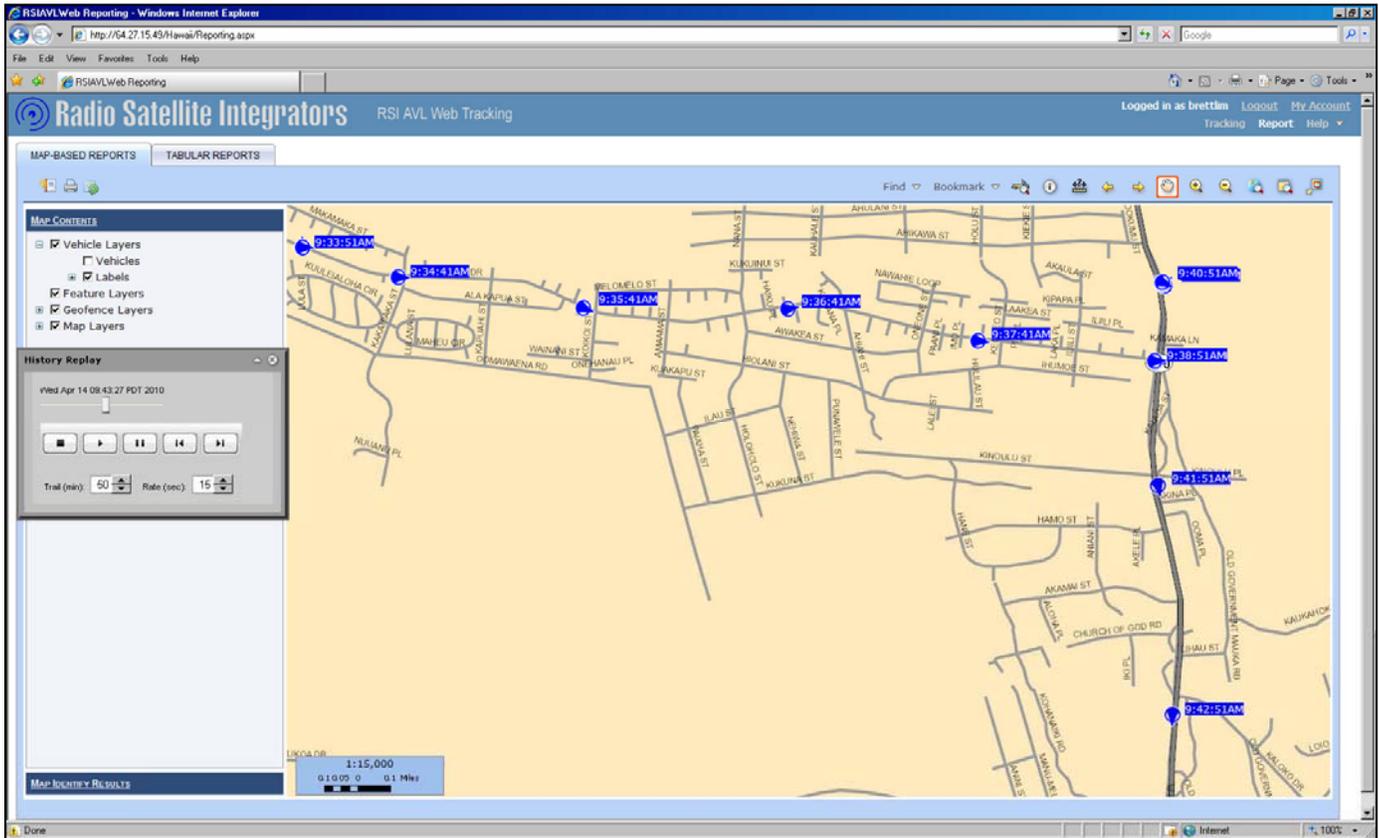


Reporting Functions

The Report Generation Application is an extension to the Real-Time Vehicle Tracking Application described above, and can generate both tabular and graphical map-based reports based on archived vehicle location and status data. Reports may be produced for selected vehicles (or groups of vehicles) according to time, location, and status criteria. The **Map-based report** displays allow users to visually display or re-trace a vehicle's route and status, and include the same map manipulation and query functionality as the real-time vehicle tracking displays. **Tabular reports** display unit location and activity in a text-based spreadsheet or table. Such reports may be exported into virtually any format including .CSV and MS Excel files.

Specific types of reports will be customized to the customers' guidelines as part of initial system design review.





Breadcrumb Replay Feature

The RSI AVL system allows you to watch a historical “replay” of any portion of a vehicle’s activity history at various speeds. Controls let you play, pause, rewind, and fast forward the replay allowing you to watch the vehicles’ movement and behavior including location, device activities, alerts, status changes, events, etc. Each breadcrumb icon represents a vehicle position and all its underlying data including address, direction, speed, and status. Breadcrumb icons can be customized to represent various statuses and events, such as ignition off/on, or a device is activated (broom, plow, armature, PTO, etc.)



Radio Satellite Integrators RSI AVL Web Tracking City of Ann Arbor

Logged in as rsadmin Logout My Account
Tracking Report Admin Help

Last Update: Wed Apr 11 11:28:09 PDT 2012

TRACKING MESSAGES ALERTS

MAP CONTENTS

MAP IDENTITY RESULTS

VEHICLE TRACKING

Group: ALL Vehicle: ALL

VEHICLE GROUP	LOCATION	SPEED	HEADING	TIME
2281 (ANNARBOR)	2285 MANCHESTER RD 48104	0	N	4/11/2012 1:41:35 PM
2285 (ANNARBOR)		0	N	4/11/2012 2:10:12 PM
2288 (ANNARBOR)	2287 MANCHESTER RD 48104	0	NE	4/11/2012 1:24:26 PM
2606 (ANNARBOR)	2419 NOTTINGHAM RD 48104	8	NW	4/11/2012 2:28:03 PM
2507 (ANNARBOR)	3580 GLAZIER WAY 48105	34	NE	4/11/2012 2:15:48 PM
2656 (ANNARBOR)	2285 MANCHESTER RD 48104	0	NE	4/11/2012 2:15:48 PM
2657 (ANNARBOR)	2318 MEDFORD RD 48104	0	N	4/11/2012 2:27:34 PM
2658 (ANNARBOR)	2253 MANCHESTER RD 48104	0	N	4/11/2012 2:11:09 PM
2659 (ANNARBOR)	2237 MANCHESTER RD 48104	0	N	4/11/2012 2:12:34 PM
3560 (ANNARBOR)		0	N	4/11/2012 10:21:25 AM
3561 (ANNARBOR)	2330 MEDFORD RD 48104	0	N	4/11/2012 1:40:51 PM
3777 (ANNARBOR)		0	N	4/11/2012 2:05:29 PM

1:32,000
0.250 0.125 0 0.25 Miles

Internet | Protected Mode: On

Client Screen with Snow Plow Route Overlays

Client Screen with Graphical Speed Report

RSIAVL Web Reporting - Windows Internet Explorer

http://64.27.15.44:8080/Reporting.aspx

Radio Satellite Integrators, Inc. Suggested Sites Web Slice Gallery Customize Links Free Hotmail Windows Marketplace Windows Media Windows

RSIAVL Web Reporting

Radio Satellite Integrators RSI AVL Web Tracking

Logged in as rsadmin Logout My Account
Tracking Report Admin Help

MAP-BASED REPORTS TABULAR REPORTS

MAP CONTENTS

- Vehicle Layers
- Vehicles
- IGN OFF
- < 30
- 30-40
- 40-50
- 50-60
- 60-70
- > 70
- Labels
- Feature Layers
- Geofence Layers
- PW Overlay
- Map Layers

1:64,000
0.3 0.15 0 0.15 Miles

Internet | Protected Mode: On



RSI AVL Web Tracking Page Method - Windows Internet Explorer
 http://localhost:1093/RSIWebAVL/Reporting.aspx

Radio Satellite Integrators RSI AVL Web Tracking
 Hi, RSIUser | Log off

MAP-BASED REPORTS TABULAR REPORTS

Radio Satellite Integrators
Vehicle High Speed Report (Tabular)
 Start Time: 2008-01-02 03:45:00 Stop Time: 2008-01-02 22:15:00
 Group Selection: ALL VEHICLES
 Generated On: 6/23/2008 2:23:41 PM

VEHICLEID	TIMEFIX	LOCATION	SPEED	HEADING
200209	2008-01-02 07:16:53	5216 E THOMAS AVE	78.90	272.00
200209	2008-01-02 07:17:53	910 N SIERRA VISTA AVE	77.51	269.70
200209	2008-01-02 07:18:53	3601 E LEWIS AVE	80.17	269.90
200209	2008-01-02 07:19:53	1940 E HARVEY AVE	77.58	255.50
200157	2008-01-02 05:28:52	6255 N BRYAN AVE	75.90	314.70
200149	2008-01-02 04:46:05	2207 E NORWICH AVE	76.48	180.60

6255105.015, 2183152.759 Local intranet 100%

Note: Your user interface will differ depending on customized configuration and preferences.

Reports

The RSI AVL system comes with a suite of standard graphical and tabular reports that cover all the main vehicle activities that one would expect from an industry leading AVL system. We have spent years working with hundreds of fleet customers to refine our report offerings to encompass the most useful and important reports. Some of our standard reports are:

- Vehicle Activity
- Travel & Stop
- Speed
- Geofence
- Vehicle Usage (Mileage & engine hours)
- Vehicle Inactivity (Idle time)
- Sensor Reports (armatures, PTO, broom, plows, etc.)

Custom Reports

RSI will work with the customer to supply a number of customized reports with the system. RSI uses industry standard database and reporting tools (Crystal Reports) so the customer can generate their own customized reports if desired.



Vehicle Activity

Generated on 7/24/2012 7:24 PM MST

Page 1 of 23

Group: 201030 WEST CONT (44 Vehicles) | Vehicle: 030080 | Timeframe: Mon 7/23/2012 12:00 AM - Tue 7/24/2012 12:00 AM

Date & Time	Location	Landmark	Speed	Heading	Event Description
201030 WEST CONT					
Vehicle: 030080					
7/23/2012 5:43:43AM	4020 W GLENROSA AVE 85019	GSC	0	N	Ignition ON
7/23/2012 5:44:43AM	4020 W GLENROSA AVE 85019	GSC	0	N	
7/23/2012 5:44:45AM	4020 W GLENROSA AVE 85019	GSC	0	N	
7/23/2012 5:48:52AM	4020 W GLENROSA AVE 85019	GSC	0	N	Armature
7/23/2012 5:58:52AM	4020 W GLENROSA AVE 85019	GSC	5	N	
7/23/2012 5:59:52AM	4205 W GLENROSA AVE 85019		28	W	Depart Geofence
7/23/2012 6:04:52AM	4234 W INDIAN SCHOOL RD 85019		34	E	
7/23/2012 6:05:52AM	3600 W INDIAN SCHOOL RD 85019		49	E	
7/23/2012 6:06:52AM	4102 N 30TH AVE 85017		49	E	
7/23/2012 6:08:52AM	0 N/A 85015		34	N	

Overspeed

Generated on 7/24/2012 10:39 PM EST

Page 1 of 1

Group: Building & Code | Vehicle: ALL | Timeframe: Mon 7/23/2012 12:00 AM - Tue 7/24/2012 12:00 AM

Date & Time	Location	Location	Description	Speed	Over Limit
Building					
Vehicle: 1545					
7/23/2012 9:31:20AM	1601 ALTON CT 33139		Overspeed	26	21
Vehicle: 2689					
7/23/2012 10:58:47AM	1601 LENOX CT 33139		Overspeed	16	11
Vehicle: 2692					
7/23/2012 6:59:34AM	STHY 112 E 33142		Overspeed	73	18
7/23/2012 7:00:34AM	STHY 112 E 33142		Overspeed	68	13
7/23/2012 7:07:34AM	1369 I 195 RAMPOFEB 33140	Central Zone	Overspeed	47	17
7/23/2012 4:26:20PM	STHY 112 W 33142		Overspeed	71	16
7/23/2012 4:45:37PM	RAMP 33012		Overspeed	43	23
7/23/2012 4:50:48PM	6945 W 24TH AVE 33016		Overspeed	36	11
Vehicle: 4174					
7/23/2012 2:33:19PM	3674 PINE TREE DR 33140	Central Zone	Overspeed	44	14
7/23/2012 2:38:43PM	1055 W 47TH CT 33140	Central Zone	Overspeed	24	19
Vehicle: 4180					
7/23/2012 11:37:55AM	1692 71ST ST 33141		Overspeed	46	16
Code Compliance					
Vehicle: 1549					
7/23/2012 7:08:07AM	1672 MERIDIAN CT 33139		Overspeed	20	15
7/23/2012 9:28:24AM	1287 COLLINS CT 33139		Overspeed	15	10
Vehicle: 1582					
7/23/2012 12:59:16AM	6301 INDIAN CREEK DR 33141	North Zone	Overspeed	43	13
Vehicle: 4196					
7/23/2012 12:47:09PM	1186 LINCOLN CT 33139		Overspeed	21	16
7/23/2012 7:56:00PM	4925 PINE TREE DR 33140	Central Zone	Overspeed	41	11
Vehicle: 4197					
7/23/2012 7:26:15PM	1707 LENOX CT 33139		Overspeed	15	10



Armature Summary

Generated on 7/24/2012 7:32 PM MST

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Group: 201030 WEST CONT | Vehicle: ALL | Timeframe: Mon 7/23/2012 12:00 AM - Tue 7/24/2012 12:00 AM

Vehicle Name	Armature Total
201030 WEST CONT	
030055	451
030057	957
030073	815
030080	707
130205	752
130206	833
130213	666
130233	702
330366	897
530444	810
530456	836
730031	1,010
730032	602
730033	2
730036	6
730038	844
830069	625
830070	877
830076	669
930176	511
930185	1,039

Armature

Generated on 7/24/2012 7:31 PM MST

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Group: 201030 WEST CONT (44 Vehicles) | Vehicle: 030080 | Timeframe: Mon 7/23/2012 12:00 AM - Tue 7/24/2012 12:00 AM

Date & Time	Location	Landmark	Event Description	Duration (HH:MM:SS)
201030 WEST CONT				
Vehicle: 030080				
7/23/2012 5:48:52AM	4020 W GLENROSA AVE 85019		Armature	
7/23/2012 6:26:59AM	18652 N 50TH AVE 85308		Armature	
7/23/2012 6:27:28AM	18646 N 50TH AVE 85308		Armature	
7/23/2012 6:28:17AM	18634 N 50TH AVE 85308		Armature	
7/23/2012 6:28:48AM	18628 N 50TH AVE 85308		Armature	
7/23/2012 6:29:32AM	18616 N 50TH AVE 85308		Armature	
7/23/2012 6:29:58AM	18610 N 50TH AVE 85308		Armature	
7/23/2012 6:30:30AM	4931 W MCRAE WAY 85308		Armature	
7/23/2012 6:30:50AM	4926 W MCRAE WAY 85308		Armature	
7/23/2012 6:31:16AM	4919 W MCRAE WAY 85308		Armature	
7/23/2012 6:31:37AM	4907 W MCRAE WAY 85308		Armature	
7/23/2012 6:32:20AM	4819 W MCRAE WAY 85308		Armature	
7/23/2012 6:32:50AM	4807 W MCRAE WAY 85308		Armature	
7/23/2012 6:33:20AM	4801 W MCRAE WAY 85308		Armature	
7/23/2012 6:34:04AM	4787 W MCRAE WAY 85308		Armature	
7/23/2012 6:35:04AM	4776 W MCRAE WAY 85308		Armature	
7/23/2012 6:35:24AM	4770 W MCRAE WAY 85308		Armature	
7/23/2012 6:35:47AM	4763 W MCRAE WAY 85308		Armature	
7/23/2012 6:36:11AM	4745 W MCRAE WAY 85308		Armature	



Vehicle Usage

Generated on 7/24/2012 9:36 PM CST

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Group: CrewTrucks | Vehicle: ALL | Timeframe: Mon 7/23/2012 12:00 AM - Tue 7/24/2012 12:00 AM

Vehicle Name	Miles Traveled	Engine Time (HH:MM:SS)	Idle Time (HH:MM:SS)
CrewTrucks			
0928046	83.7	9:08:00	2:46:00
1125022	61.2	7:37:00	3:01:00
1125024	108.7	12:21:00	6:21:00
1130010	58.6	13:07:00	7:13:00
1130029	28.3	8:59:00	5:25:00
1132023	65.6	14:07:00	10:27:00
1231026	70.8	16:14:00	9:58:00

Vehicle Spreader Utilization

Generated On: 8/2/2011 4:09:14PM

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Group Selection: ALL VEHICLES | Start Time: 2011-03-01 00:00:00 | Stop Time: 2011-03-31 23:59:59 |

Timefix	Spreader Status	Granular			Direct		
		Spread Rate Index	Material Setting (lbs/mi)	Material Total (lbs)	Spread Rate Index	Setting (gal/mi)	Total (gal)
PLOW							
Vehicle ID: 42356							
03/29/11 08:34:07	P	0	0	0	0	0	72657
03/29/11 08:34:08	O	0	0	0	0	0	72657
03/29/11 08:34:42	S	0	0	0	9	100	72657
03/29/11 08:34:55	S	0	0	0	6	60	72660
03/29/11 08:34:55	S	0	0	0	6	60	72660
03/29/11 08:34:55	S	0	0	0	6	60	72660
03/29/11 08:34:56	S	0	0	0	0	140	72661
03/29/11 08:35:12	S	0	0	0	0	140	72662
03/29/11 08:36:01	O	0	0	0	0	0	72691
03/29/11 08:36:08	S	0	0	0	0	140	72691
03/29/11 08:37:09	S	0	0	0	9	100	72762
03/29/11 08:37:19	S	0	0	0	0	140	72770
03/29/11 08:39:12	O	0	0	0	0	0	72902
03/29/11 08:40:29	S	0	0	0	0	140	72902
03/29/11 08:43:10	O	0	0	0	0	0	73089
03/29/11 08:43:10	O	0	0	0	0	0	73089
03/29/11 08:44:50	S	0	0	0	8	80	73094
03/29/11 08:44:51	S	0	0	0	7	70	73094
03/29/11 08:44:52	S	0	0	0	8	80	73095
03/29/11 08:44:52	S	0	0	0	9	100	73096
03/29/11 08:49:05	O	0	0	0	0	0	73307
03/29/11 08:54:28	S	0	0	0	9	100	73307
03/29/11 08:57:59	B	0	0	0	0	100	73307
03/29/11 08:58:04	S	0	0	0	9	100	73310



Optional Custom Garmin Messaging Terminal

For systems that require integrated messaging and navigation capabilities for its drivers, RSI offers a customized Garmin navigation solution. This customization process allows us to use the Garmin unit as a messaging terminal providing both free form and pre-programmed status messages between the driver and the dispatch user. Leveraging the universally familiar Garmin color touch screen interface, RSI creates a powerful messaging and data terminal for your drivers. In addition to providing the standard Garmin navigation tools, the RSI customization allows the mobile user to receive dispatched destinations, way points and routes from the base directly to the Garmin unit, which will then navigate them to that location. Drivers can login to the system using a Driver and Route Login form, as well as send any variety of free form or preprogrammed status message to the base. The customization options are endless. RSI will work with you to determine how we can implement a system that fits your needs at the lowest cost possible.



GARMIN™



Customized Messaging Terminal



The RSI Garmin Unit can be configured to provide a simple two-way messaging interface between the driver and AVL mapping operator. All messages sent by the driver are time and location tagged and can be used for a variety of status updates and activity reporting.



Messaging can be either free form text messages or preprogrammed (canned) status messages.



Canned messages can be custom created by RSI for any of your fleet's unique operations, priorities, and terminology. The driver simply selects a preprogrammed message to be sent back to the operator and system.





Garmin Navigation Tools



The RSI Garmin Unit also retains its core Garmin navigation functionality that provides voice guided turn by turn directions to the desired destination.



The RSI Garmin Unit has multiple settings for a viewing the map and route as the driver is guided to the destination



Driver ID Entry



The RSI Garmin Unit allows the driver to log in to a vehicle with a unique ID as well as status.



Methodology

Implementation Time Line

Radio Satellite Integrators will determine an appropriate implementation schedule for each specific project and customer. Here is a typical schedule to implement the system as outlined below. Some key milestones follow. (This is an example subject to change. A detailed and accurate project work plan cannot feasibly be created without meeting with the customer to determine specific configurations, preferences, processes, priorities, resources, etc.)

AVL System System Implementation Schedule							
ID	%	Task Name	Start	Finish	Duration	Precedes	Resource Names
1	0%	AVL Project Completion	Tue 5/1/12	Thu 8/23/12	83 days		
2	0%	Receipt of Order	Tue 5/1/12	Tue 5/1/12	1 day		Customer
3	0%	Design Review	Wed 5/2/12	Tue 5/22/12	15 days	2	
4	0%	Develop Design Review	Wed 5/2/12	Tue 5/15/12	10 days		RSI/Customer
5	0%	Submit Design Review	Wed 5/16/12	Tue 5/22/12	5 days	4	RSI
6	0%	Design Review Acceptance	Tue 5/22/12	Tue 5/22/12	0 days	5	Customer Project Team
7	0%	Base Station System Install/Config	Wed 5/2/12	Tue 5/22/12	15 days		
8	0%	GIS Map Data	Wed 5/2/12	Tue 5/8/12	5 days		Customer GIS Department
9	0%	Server Software Installation	Wed 5/9/12	Tue 5/22/12	10 days	8	RSI
10	0%	Base Station System Completed	Tue 5/22/12	Tue 5/22/12	0 days	9	RSI
11	0%	Shipping Phase	Wed 5/2/12	Mon 6/18/12	34 days		
12	0%	System Delivery	Wed 5/2/12	Mon 6/18/12	34 days		
13	0%	Mobile Unit Build Procurement	Wed 5/2/12	Mon 6/11/12	29 days		
14	0%	Mobile Units	Wed 5/2/12	Mon 6/4/12	24 days	2	RSI
15	0%	Testing	Tue 6/5/12	Mon 6/11/12	5 days		
16	0%	Mobile Units	Tue 6/5/12	Mon 6/11/12	5 days	14	RSI
17	0%	Shipping	Tue 6/12/12	Mon 6/18/12	5 days		
18	0%	Mobile Units	Tue 6/12/12	Mon 6/18/12	5 days	16	RSI
19	0%	50% System Payment Milestone	Mon 6/18/12	Mon 6/18/12	0 days	18	Customer
20	0%	System Completion	Tue 6/19/12	Mon 7/9/12	15 days		
21	0%	Training (Installation)	Tue 6/19/12	Thu 6/21/12	3 days	17	RSI
22	0%	Configuration	Fri 6/22/12	Thu 6/28/12	5 days	21	
23	0%	Complete ATP	Fri 6/29/12	Mon 7/9/12	7 days	21,22	
24	0%	25% Payment Milestone	Mon 7/9/12	Mon 7/9/12	0 days	23	Customer
25	0%	User Training	Tue 7/10/12	Mon 7/23/12	10 days		
26	0%	Develop User Training Plan	Tue 7/10/12	Mon 7/16/12	5 days	23	RSI PM
27	0%	Complete User Training	Tue 7/17/12	Mon 7/23/12	5 days	26	RSI PM / Customer Users
28	0%	25% Payment Milestone	Mon 7/23/12	Mon 7/23/12	0 days	25	Customer
29							
30	0%	Mobile Unit Installation	Fri 6/22/12	Thu 8/23/12	45 days	21	Customer Installation Team



Project Management

The RSI project manager will serve as the liaison for RSI during the implementation process and through the duration of the system. The project manager will serve as the point of contact for all technical and support issues.

Implementation

The Project Manager will schedule periodic calls/meetings to monitor the initial implementation and installation process. Communication is key in our implementations so we will be using a variety of methods including e-mail and telephone, as well as in person meetings when appropriate. Scheduling and planning will utilize industry standard project management tools such as Microsoft Project and other related systems.

Project Initiation

Introductions

Kick Off Meeting

Project Planning

Design Review

Define Roles and Responsibilities

Expectations

Project Execution

Scheduled Communication

Status Updates

Resolving Issues

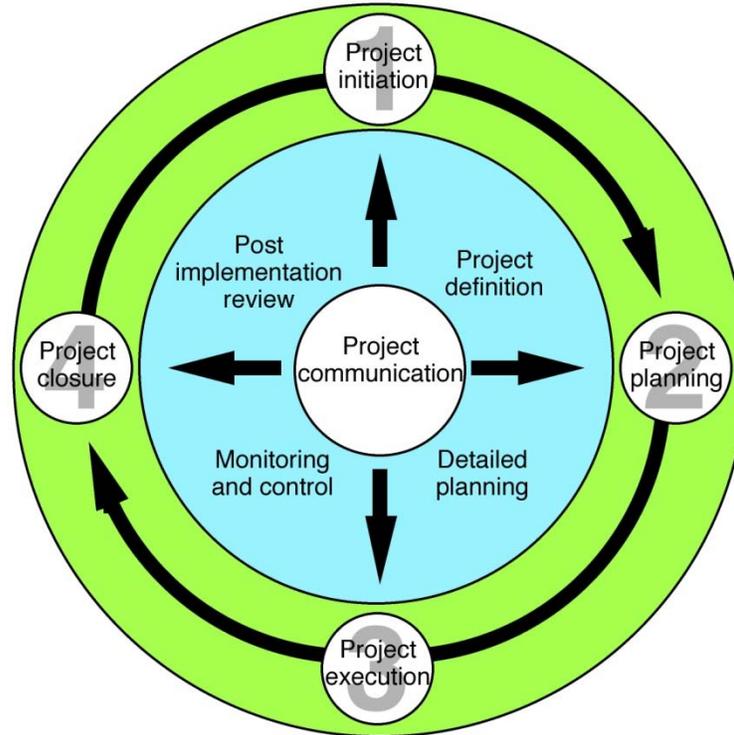
Developing Options

Following Up

Project Closure

Acceptance Testing

Final Review



Project Manager

Brian Burda, Vice President Technology

Education: B.S. Computer Science, University of Southern California

Experience:

Consultant, Process Control and Software Development, Clients include H.J. Heinz, United Airlines, ORE-IDA Foods, Weight Watchers, and the Marriott Hotel Corporation

*Brian has 20 years of experience implementing AVL and tracking systems using GPS.

Brian will serve as the lead project manager for the AVL implementation. Brian has extensive experience implementing AVL systems and will oversee the development of the Scope of Work and Implementation Work Plan.



Key RSI Staff

Lead Software and Hardware Integration Manager

Mark Holzworth, Director of Software Engineering

Education: B.S. Electrical Engineering, University of California at Santa Barbara

Experience:

Software engineer, Professional Products, Magellan Systems Corporation

*Mark has over 18 years of experience in developing software to interface GPS and GIS, and embedded network communications control systems for AVL.

Mark will oversee all integration efforts for this system. Mark has extensive experience interfacing various back end applications with the RSI AVL system.

Executive Contact

Jonathan Michels, President

Education: B.S. Economics, Wharton School of the University of Pennsylvania
M.B.A., AGSM, University California at Los Angeles

Experience:

Director, Professional Products Division, Magellan Systems Corporation (GPS Manufacturer)

Vice President, Cellularm, radio frequency data network operator

GIS Analyst, Toyota Motor Sales, USA

*Jon has over 24 years of experience in GIS, 21 years in RF communications and data, and 20 years in GPS technology.

Jon will serve as the main point of contact for all contractual and administrative matters for this system.



Installation

If desired, RSI can be responsible for the installation of all equipment furnished under this contract. RSI will perform the installation and provide local support. RSI will require the client's cooperation and assistance in coordinating vehicle access and availability.

All work will be executed in the manner best calculated, according to local conditions, to promote rapidity and accuracy; to secure safety to life, personnel and property; to assure safe and continuous operation of the existing dispatch, computer, and daily operations; and, to reduce to a minimum any interference with the public and with other contractors in or about the property.

Management and Installation

The installation team manages all aspects of the installation of these units by working closely with client representatives. Together, the installation team and client will identify vehicles and schedule installations on a non-intrusive basis. Installation of RSI Mobile hardware units will be verified by inspections. Typically, we perform a physical checkout of the installation, which includes ensuring proper form, fit, security, and location of the unit. In addition, a communications check is performed to ensure that the modem is operational.

Operational Checkout

Upon completion of a small subset of the entire installation, we will perform a complete operational checkout of the hardware and firmware. This checkout will ensure bi-directional communication between the RSI Mobile hardware unit and RSI Base Server and verify the accuracy of receive/transmit (RX/TX) event data shared between the RSI Mobile hardware units and The RSI Base Server software. Upon successful completion of this test, the units and vehicles are tagged as "ready for integration."



Training

RSI Training Methodology

RSI will provide live training sessions on the entire AVL system sufficient to ensure complete understanding and operations proficiency by the desired client staff and administrative personnel. The client will receive training to be provided to the entire staff exposed to the system, with an intensive “train-the-trainer” approach for selected personnel in order to maximize long-term worker productivity. The training sessions shall be held at locations specified by the client for administrative, driver, dispatch, executive, maintenance, and all other relevant parties. All materials and manuals will be provided in both printed and electronic format.

Training Program Overview

RSI and the other team members will work with the customer’s team to define the required courses and a reasonable number of attendees/course duration during the implementation phase of the project.





Training Program

The RSI AVL Training Program is designed to indoctrinate all employees in the use of the RSI AVL System.

All training will be specific, where appropriate, to the RSI AVL system, and will include practical user instruction, hands-on sessions using RSI AVL specific equipment and data, and vendor observation of live operations following system startup. The training sessions will be presented over the course of the project, and will enable customer personnel to assume the responsibility of the system upon Substantial Completion.

In concert with the customer Project Manager, RSI will develop and conduct a one-time operational overview of the entire RSI AVL operating system, which will provide Management with a practical, working knowledge of the RSI AVL system and its operational, customer, and functional capabilities.

The development of the Training and Orientation Program and the scheduling of the actual training sessions will take into consideration customer staff availability due to shift assignments and logistics. RSI AVL will coordinate with the customer Project Manager to ensure that personnel are available when the Training Programs are to be conducted. Furthermore, it is assumed that all attendees will be familiar with the basic concepts of the Windows Operating System, knowledge that is essential in order to be able to take full advantage of the courses offered. A workable understanding of Windows will be a pre-requisite for all attendees.

Advanced Training

During the installation and testing process there will be a need for certain customer personnel (drivers, dispatchers and supervisors) to become familiar with some of the fundamental aspects of the system so they can participate in the testing process and in the evaluation of the software and system's performance. For this reason, a number of courses will be provided in advance of the Regular Training program. The content of the courses will focus on familiarizing select RSI AVL staff with the basic functionality and operational features of the system, together with 'hands-on' training in the use of the hardware to the extent necessary to support the initial Testing. RSI will provide Advance Training as necessary to support initial testing and integration.

The customer's Project Manager will designate the specific individuals who will participate in this training when RSI indicates it is time to begin the Advance Training Course.

RSI will supply the specified manuals and documentation in both hard and soft copy.



Instruction Manuals

User/Operating Procedure manuals, specific to the RSI AVL System, will be provided to each trainee. The User/Operating Procedure manuals will consist of the generic capabilities for each component as well as all the necessary amendments that describe customer's specific modifications and enhancements. Course Training Manuals, for each functional or technological area of training, will be provided to the customer Project Manager, along with master copies of all training and orientation documents in order to facilitate duplication of materials for future training purposes. Vendor equipment manuals relating to the specific software and hardware utilized in the project will also be delivered to the customer's Project Manager. (Note: Any duplication of materials is for internal use on the RSI AVL Project and may NOT be distributed to outside sources without the written approval of the vendor.)

All such printed training/orientation materials will be:

- Approved by the customer Project Manager prior to their use or distribution
- Customized and specific to the RSI AVL Project and the products used therein and the systems operating therein.
- Complete and current as of the date of Substantial Completion of the RSI AVL Project.
- Easily understandable, detailed and focused to the inherent knowledge levels of each of the below-described staff categories based on their individual 'need to know'.
- Updated, as necessary, consistent with any maintenance and support agreements to this Project.



Personnel To Be Trained

There will be several levels of staffing associated with the RSI AVL operation; therefore, the training and orientation program will focus on both the required ('need to know') and inherent technical expertise of each of the employee groups or individuals, as follows:

Drivers

Anticipated staff (final count TBD)

An in depth orientation in the AVL System function, usage, and dispatching requirements at the vehicle level.

A basic orientation in AVL System functionality and trouble shooting (when to ask for help).

A practical orientation in System capabilities as they relate to overall operations and customer services.

Dispatchers

Anticipated staff (final count TBD)

An in-depth orientation in the usage and a practical orientation in the features relating to operations and customer services of all AVL equipment at the vehicle and Dispatch Center levels.

A basic orientation in function trouble shooting (when to ask for help) at both the vehicle and dispatch center levels.

An in-depth orientation in data entry and retrieval, report design, generation and production.

Supervisors

An anticipated staff (final count TBD)

An in-depth orientation in the usage and a practical orientation in the features relating to operations and customer services of all AVL equipment at the vehicle and Dispatch Center levels.

A basic orientation in function trouble shooting (when to ask for help) at both the vehicle and Dispatch Center level.

The ability to train new drivers, dispatchers and supervisors in the use of and overall understanding of system functionality as it relates to all components and features of the RSI AVL technology.

Operator Management

An anticipated staff (final count TBD)

An in-depth orientation in the usage and a practical orientation in the features relating to operations and customer services of all AVL equipment at the vehicle and Dispatch Center levels.



A basic orientation in function trouble shooting (when to ask for help) at both the vehicle and Dispatch Center levels.

An orientation in systems management, the interoperability of the overall RSI AVL system capabilities, customer service features and potential report development and generation.

Maintenance monitoring requirements of the equipment and software and system repair and service procedures.

Client Management

An anticipated staff (final count TBD), including the Director, Information Systems Manager and administrative staff. (final count TBD)

An in-depth orientation in the usage and a practical orientation in the features relating to operations and customer services of all AVL equipment at the vehicle and Dispatch Center levels.

A basic orientation in function trouble shooting (when to ask for help) at both the vehicle and Dispatch Center levels.

An orientation in systems management, the interoperability of the overall RSI AVL system capabilities, customer service features and potential report development and generation.

Maintenance monitoring requirements of the equipment and software and system repair and service procedures.

Note: The Information Systems Manager will be trained to a significantly higher technical level. This individual will perform technical maintenance, hardware repair/replacement, troubleshoot problems, investigate communication system problems (LAN, WAN, etc.) and deal with all technical problems and upgrades in cooperation with RSI.



Test and Implementation Plan

The major purpose of the Implementation Plan is to define a process for deploying the technical elements of the RSI AVL Project, and then schedule the integration of these elements into each agency's operating system. This transition not only calls for a partial re-deployment and enhancement of the current rolling stock, but also for the smooth integration and deployment of the AVL technology that is specified in the Scope of Work. In order to make the transition as smooth as possible and overcome any functional, technical, operational, and communication difficulties as they arise, RSI will utilize a phased approach.

At the same time, in order to ensure the final delivery of a system that conforms to the Project requirements, significant emphasis will be placed on the importance of achieving the operational and technological functionality defined in this Scope of Work and other 'Contract Documents'. The Implementation and Test Plan represents the vehicle through which RSI shall examine each operating function of the RSI AVL system to:

- Verify compliance with the system specifications, level of service standards and operating performance criteria
- Obtain client's acceptance.

RSI will be responsible for component specific testing. As integration of the technical components begins, client's Project Manager (& necessary staff) will oversee and coordinate the implementation of the integration testing in order to ensure compliance with the overall project and performance objectives set forth herein. The anticipated dates for conducting the required testing are defined in the Project Work Plan and will be finalized during the Design Review.

Two levels of system testing will be employed during the course of the RSI AVL Project, as follows:

Laboratory: individual module testing followed by integration testing to ensure the functionality of the components and the interoperability of the data interfaces between each component prior to deployment.

Acceptance Testing: the final test to ensure that each technical component of the system as well as the total system (technical components and operating services) conforms to system specifications, level of service standards and operating performance criteria.

As each service element comes on-line during the Test, it will remain on-line at the conclusion of the test and be operated in parallel by the Dispatch Center with the other elements that are already operational. The same will hold true for the activated functionalities of the project technologies mentioned above. Due to the linear approach of the project plan, if any of the elements fail during testing, further elements cannot be deployed until the problem has been resolved.



At the conclusion of each formal testing phase, RSI will provide client with written certification of the test results and performance compliance for each of the system components. In the event of testing problems, client, RSI and the appropriate agencies will meet and confer on the results of the testing performed. Subsequent decisions to proceed with the project must be approved by all parties. All the participants must attend scheduled meetings through means of conference calls or on-site visitations.

Also, final details of the Laboratory and Acceptance Tests will be confirmed with the Stakeholders before implementation of the testing in order to ensure client service level does not degrade below current service levels during the testing process.

Finally, in addition to the above formal testing procedures, there will be a comprehensive demonstration of the operating system to client. This demonstration (Acceptance Test) is necessary in order to satisfy the parties that Substantial Completion has been achieved.

Acceptance Testing

There are two fundamental aspects to the Acceptance Testing – functional and operational. The functionality of the RSI AVL System will have been completely tested by the Test phase of the project. To a lesser extent, the ability of the user to change the operational parameters in order to change the service provided will have also been demonstrated. As a consequence, the Acceptance Test is largely a confirmation of the functional requirements and a stress / full loading test of the operation as the service parameters are changed based upon real time public demand.

Because of the inherent inability to predict the need for service changes, it is only by observing the system over a period of time that we can be reasonably assured that all the possible combinations and scenarios have been considered. During the Acceptance Testing the performance of the System will also be evaluated, with regard to the ability of the system to respond in a timely and efficient manner to customer oversight and customer requests.



Warranty

As an expression of confidence in our products to continue meeting the high standard of reliability and performance that our customers have come to expect, Radio Satellite Integrators products are covered by the following warranty.

Radio Satellite Integrators warrants all products against defects in materials and workmanship for a period of one year from the date of factory sale, or the term outlined in an extended warranty agreement. During the warranty period Radio Satellite Integrators provides the warranty service. Radio Satellite Integrators will, at its option, either repair or replace products which prove to be defective. The Customer shall prepay shipping charges for products returned to Radio Satellite Integrators for warranty service and RSI shall pay for return of products to Customer. However, the Customer shall pay all shipping charges, duties, and taxes for products returned to Radio Satellite Integrators from outside the United States. This warranty shall not apply to damage resulting from:

- Improper or inadequate maintenance by the Customer
- Customer-supplied interfacing
- Unauthorized modification or misuse
- Operation outside of the product environmental specifications
- Improper installation, where applicable

No other warranty is expressed or implied. Radio Satellite Integrators specifically disclaims the implied warranties of merchantability and fitness for a particular purpose. Remedies provided herein are Customer's sole and exclusive remedies. Radio Satellite Integrators shall not be liable for any direct, indirect, special incidental, or consequential damages, whether based on contract, tort, or any other legal theory.



Service Response Plan

The following is RSI's standard Customer Support Plan:

RSI will maintain all equipment and support software for one year, parts and labor. In addition, RSI will provide two options to help ensure smooth operation of the system:

1) Phone Support During the warranty period, RSI will provide unlimited phone support via our toll-free number [(866) 869-7700]. After hours support is available 24/7 through the 911 option on our telephone system.

2) Remote Access Support

This option allows RSI staff to check in on system health, troubleshoot problems on-line with customer staff and monitor the system remotely via dial-up or TCP/IP (VPN) access.

Any travel required to support on-site service is not included.

Severity	Time Reported	Target Response Time	Response Method
1	7x24	<4 Hours	Phone Call (Follow-up with Remote Access Troubleshooting as Necessary)
2	Regular Hours	<3 Hours	Phone Call (Follow-up with Remote Access Troubleshooting as Necessary)
2	After Hours	Next Business Day	Phone Call (Follow-up with Remote Access Troubleshooting as Necessary)
3	Regular Hours	<8 Hours	Phone Call (Follow-up with Remote Access Troubleshooting as Necessary)
3	After Hours	Next Business Day	Phone Call (Follow-up with Remote Access Troubleshooting as Necessary)

The Customer acknowledges and understands that the Service Provider's ability to respond within these times is dependent on the Customer's fulfillment of its obligation to provide remote access. * Response time targets are measured from receipt of first notification by telephone to our Main Office Number [(310) 787-7700] or toll-free number [(866) 869-7700]. For after hours calls follow our instructions for Emergency Service, directory 911. A page will go out to an on-call support provider.

***Regular Hours are defined as Monday through Friday, 9 A.M. to 5 P.M. Pacific Time, excluding holidays. After Hours are all non-Regular Hours.*

Problem Severity Definitions

- a. **Severity 1** – A Severity 1 Problem is a catastrophic failure that severely impacts the Customer's ability to conduct its core business – i.e., the Customer's Automatic Vehicle Locator and/or Mobile Data System are down or not functioning and no procedural workaround exists.



b. **Severity 2** - A Severity 2 Problem is a high-impact Problem that disrupts important functions of the Customer’s operation, but the Customer can still remain productive and maintain necessary business-level operations.

c. **Severity 3** - A Severity 3 Problem is a Problem that is of lesser magnitude than a Severity 1 or 2 Problem.

Problem Resolution Targets

a. **Severity 1** - When working a “Severity 1” Problem, the objective is to resolve the Problem entirely or to downgrade the Problem’s Severity designation (*i.e.*, provide Customer sufficient functionality so that the Problem may be reclassified as Severity 2 or 3) within 24 hours after the Problem is reported. Efforts to isolate, diagnose, and effect a work-around for, repair, or downgrade a “Severity 1” Problem shall be continuous (*i.e.*, around-the-clock) between Customer, Service Provider and RSI (as needed), provided that Customer performs all of its obligations hereunder, including providing remote access to its systems. Periodic phone contact and progress updates will be provided at regular intervals during problem resolution. When the severity level has been changed to “Severity 2” or “Severity 3,” the guidelines cited below are followed.

b. **Severity 2** – When working a “Severity 2” Problem, the objective is to have a solution and/or fix to the Customer within fifteen (15) business days. Efforts to isolate, diagnose, and affect a work-around or repair to a “Severity 2” Problem shall be continuous during Regular Hours. Customer resources may need to be available after hours and/or weekends upon mutual agreement between Customer and Service Provider, on a case-by-case basis.

c. **Severity 3** - When working a “Severity 3” Problem, the objective is to get the Customer a fix to the Problem or develop a workaround acceptable to the Customer within thirty (30) business days. Such a fix will typically be provided via a software patch or upgrade from RSI.

Reference #	Requirement	Response (Y,Z,N,T)	Xrf
3.3.5.1	Toll Free Support Phone Number	Y	
3.3.5.2	24x7 Support	Y	
3.3.5.3	Software/Application Support	Y	
3.3.5.4	Remote diagnostic support software	Y	
3.3.5.5	Remote diagnostic support hardware	Y	
3.3.5.6	Documented escalation procedures	Y	
3.3.5.7	Dedicated Tier 2 (Mid-Level expertise) support staff	Y	
3.3.5.8	Dedicated Tier 3 (Senior-Level expertise) support staff	Y	
3.3.5.9	Portal to exchange information and support	Y	



Detailed RFP Responses

RSI Note: Using the “response value” codes for some of these requirements did not enable us to accurately answer or convey our ability to meet the specification. There are many specifications that we are capable of meeting, however we have no detailed information on the specification to enable us to accurately price or gauge the work needed, which may be included, optional, or easily customized. In particular this affects our answers for interfacing to third party applications- which we specialize in, but we need more information from you.

Since the “Y” code means there is no additional cost, we thought it unwise to use this since that is always a possibility. The “Z” code also infers that there is no additional cost. The “N” code states that we unable to do it, even with customization- which is not accurate either.

We highly encourage the City to engage us in conversation to more accurately gauge our high level of capability in the area of third party interfacing and customized AVL systems.

SECTION 6 – Process Automation Requirements

6.1.1 PROCEDURE - Assign the vehicle to a route

Dispatch will assign a specific type of vehicle to the route depending on the type of activity to be performed.

Reference #	Requirement	Requirement Type	Response	Xrf
6.1.1.1	Add a vehicle to a predetermined group	User interface	Y	Comply. The RSI AVL system is highly customizable and allows the user to add/edit/remove vehicle units and users.
6.1.1.2	Change the vehicle from one group to another	User interface	Y	Comply. The RSI AVL system is highly customizable and allows the user to add/edit/remove vehicle units and users to different groups.
6.1.1.1	Change display icons for vehicles of the same group.	User interface	Y	Comply. RSI can configure the vehicle icons to indicate (using colors, directional symbols, labels, and size) various vehicle attributes (such as ID, status, speed, heading, etc.).



6.1.2 PROCEDURE - Retrieve the vehicle from lot

After dispatch makes vehicle assignments, the driver walks into the lot to locate and drive the vehicle assigned to his route.

Reference #	Requirement	Requirement Type	Response (Y, Z, T, N)	Xrf
6.1.2.1	Identify the location of vehicles within the parking area (e.g. CVMF parking lot).	User interface	Y	Map query options include the ability to locate an address, vehicle, or stop. Since the RSI AVL Mapping application is actually based on the actual ESRI ArcGIS Server we can incorporate your own facilities GIS map data if available.
6.1.2.2	Transmit a specific signal from the vehicle indicating that the vehicle is parked for service	User interface	Y	Comply. Using the optional Garmin Messaging terminal, the driver can select a service status. In addition the dispatcher can place the vehicle into a service status as well.

6.1.3 PROCEDURE - Drive the vehicle

The location of a particular job can be pre-determined if it is part of a regular route, or can be inferred from a work order / work request, and then the vehicle(s) involved in performing the same will drive to this address/location.

Reference #	Requirement	Requirement Type	Response (Y, Z, T, N)	Xrf
6.1.3.1	Perform engine kill after deeming it is safe to do so in lost or stolen equipment	User interface	N/Y	Comply. We can provide an optional engine kill, however we highly recommend against this feature as there are tremendous liability and safety issues involved. We would like to discuss this further with the city.
6.1.3.2	Perform route playback.	User interface	Y	Comply. The RSI AVL system allows you to watch a historical "replay" of any portion of a vehicle's activity history at various speeds. Controls let you



				play, pause, rewind, and fast forward the replay allowing you to watch the vehicles' movement and behavior including location, device activities, alerts, status changes, events, etc. Each breadcrumb icon represents a vehicle position and all its underlying data including address, direction, speed, and status. Breadcrumb icons can be customized to represent various statuses and events, such as ignition off/on, or a device is activated (broom, plow, armature, PTO, etc.)
6.1.3.3	Provide a bread crumb trail for a specified time frame with no limitations on the different factors.	User interface	Y	Comply. See above.
6.1.3.4	Capture geo-fence based events.	User interface	Y	Comply. The RSI AVL system has highly advanced geofencing functions as it is a full GIS. We can incorporate geofences based on radius, polygons, or even lines. The RSI AVL system allows the user to set geo-fences that are even related to routes and a specified buffer of deviation from said route/line. RSI is able to do this due to the underlying ESRI ArcGIS engine.
6.1.3.5	Auto email resources when a geofence event triggers. The City uses MS Exchange Server / Outlook for email applications and the vendor should be able to provide this service in the specified software environment.	Report	Y	Comply. The system can be configured to notify selected users when specific events occur with any of the vehicles. This includes geofences, hours of operation, idle, panic buttons, etc. Notifications can be sent as an e-mail, SMS, or to the alert screen on the software.



6.1.3.6	Have unlimited geo-fences on a map.	User interface	Y	Comply. Geofences can be created as polygons or a configurable radius from a specific point, as well as created from existing boundaries, landmarks or zones within your GIS.
6.1.3.7	Have overlapping geo-fences.	User interface	Y	Comply.
6.1.3.8	Activate or deactivate geo-fences based on the activity that we monitor.	User interface	Y	Comply.
6.1.3.9	Locate vehicle or vehicle groups at any given time.	Report	Y	Comply. The map window can be set to display a particular area, route, stop, or address, or to track a specific sub-set of the entire fleet (from the entire fleet to an individual vehicle).
6.1.3.10	Optimize the different routes to reduce vehicle miles travelled. The City uses RouteSmart Technologies' RouteSmart® for route optimization and the vendor must either integrate with RouteSmart® or provide an ancillary add-on to the AVL solution for route optimization.	User interface	N	We do not provide route optimization as RSI AVL is not a routing system, however we can fully integrate and display routes from RouteSmart or other routing companies in our AVL display. Both RSI and RouteSmart are ESRI Authorized Business Partners.
6.1.3.11	Set the ping rate based on vehicle type and / or use.	User interface	Y	Comply. The RSI AVL system can update at virtually any rate. Update rates can adjust dynamically depending on factors such as vehicle status or the triggering of an on-board sensor. RSI typically recommends once per 30-60 seconds, plus all events such as start, stop, turns, ignition, sensors, etc. RSI will configure the ping rates.
6.1.3.12	Store data on the device and forward (session persistence) when it can communicate back to the base.	Other	Y	Comply. The RSI Mobile Unit can store and forward all data. These messages are time and location tagged and will be sent



				when in wireless coverage.
6.1.3.13	Set what types of data are transmitted in real-time or near real-time (e.g. Location, Engine Trouble) and what types are stored for download (passive) at the end of the day (e.g. Time Between Service Stops) determined on a per vehicle basis	User interface	Y	Comply. With cellular based communications, it does not matter when it is sent, the price for sending data is the same. If the device is a hybrid, with WiFi capabilities, we can configure which data to send, and when.
6.1.3.14	Notify 911 or trigger emergency alarms from the device for certain vehicle (e.g. Panic button).	System Interface	Y	Comply. The RSI Mobile Unit can be equipped with an emergency panic button configuration that is a dashboard-mounted button that sends a priority signal over-the-air to the dispatch interface or real-time alert. RSI can also offer a wireless handheld panic button that can be activated up to 300 feet from the vehicle.
6.1.3.15	Capture vehicle maintenance and emergency repair issues (e.g. Engine light). The City uses CCG Systems' FASTER Fleet Management for management of its fleet of vehicles and equipment. The vendor must be able to provide integration with FASTER.	Report	Y	Comply. RSI can hand off vehicle data to any third party including fleet maintenance applications. RSI can provide mileage, engine hours, check engine light data, etc. As an option, an interface to engine diagnostics can be added to the RSI AVL system giving you real-time access to engine trouble codes and other vehicle information for either light duty or heavy duty vehicle types. <u>Interfacing can have additional costs from both RSI and your vendors, which are not included. More detail is required to price this accurately.</u>
6.1.3.16	Recognize and flag dangerous maneuvers (e.g. U-turns).	Report	Y	Comply. The RSI Mobile Unit can detect unsafe



				driving behavior such as harsh acceleration/braking using an gyro/accelerometer.
6.1.3.17	Notify (email, SMS) system administrator on alerts, alarms or flagged data. The City uses MS Exchange Server / Outlook for email applications and the vendor should be able to provide this service in the specified software environment.	Report	Y	Comply. The RSI AVL system allows authorized administrators extensive control over system features including alerts and alarms. Notifications can be sent as an e-mail, SMS, or to the alert screen on the software.
6.1.3.18	Configure the unit to provide turn by turn directions.	User Interface	Y	Comply. The optional RSI customized Garmin Unit has navigation functionality that provides voice guided turn by turn directions to the desired destination.
6.1.3.19	Install modular AVL hardware to permit tracking a specific subset of vehicles through component removal and re-installation.	Other	Y	Comply.
6.1.3.20	Vehicle operators can “flag” specific locations, and annotate conditions for immediate alert and follow-up, specifically upon encountering a potentially hazardous condition.	Business Form	Y	Comply.
6.1.3.21	Track vehicle speed.	User interface	Y	Comply. The Vehicle Activity reports shows speed for each data point. RSI can provide alerts and reports on speed relative to a global setting. As an option, RSI can create speed reports related to actual speed limit based on the street segment speed attribute data in your GIS.
6.1.3.22	Track and report on vehicle miles travelled. The City uses CCG Systems' FASTER Fleet Management for management of	Report	Y	Comply. See 6.1.3.15



	its fleet of vehicles and equipment. The vendor must be able to provide integration with FASTER.			
6.1.3.23	Initiate an alert if a vehicle becomes stationary for more than the designated period of time while the engine is running (i.e. Idle time).	Report	Y	Comply. The system can be configured to notify selected users when a vehicle becomes stationary for more than the designated period of time while the engine is running. Notifications can be sent as an e-mail, SMS, or to the alert screen on the software.
6.1.3.24	Set minimum speed levels for reports based on activity.	Report	Y	Comply. The Vehicle Activity reports shows speed for each data point. RSI can provide alerts and reports on speed relative to a global setting. As an option, RSI can create speed reports related to actual speed limit based on the street segment speed attribute data in your GIS.
6.1.3.25	Utilize “geo-fences” to deter travel beyond approved geographic limits and identify potential abuses.	User Interface	Y	Comply. The RSI AVL system allows the user to set geo-fences on the map display. This geofence will create an alert and/or exception report when breached and will appear as another item of status data with each vehicle position report. Geofences can be created as polygons or a configurable radius from a specific point, as well as created from existing boundaries, landmarks or zones within your GIS.
6.1.3.26	Transmit alerts using data from the obd2 (on board diagnostic software) would be sent out over a communication network	System Interface	Y	Comply. Engine diagnostics can optionally be added to the RSI Mobile Unit giving you real-time access to engine trouble



	indicating when preventative maintenance is required. The City uses CCG Systems' FASTER Fleet Management for management of its fleet of vehicles and equipment. The vendor must be able to provide integration with FASTER.			codes and other vehicle information. Diagnostic technologies vary and some vehicles do not have diagnostics. RSI AVL can hand this and other data to the FASTER system. See 6.1.3.15
6.1.3.27	“Encrypt” wireless data streams.	Other	Y	Comply. All data sent over the cellular network will be in highly secure packetized data streams.
6.1.3.28	Notify the vehicle driver approaching hazardous/ road conditions (e.g. Speed bumps) with periodic refresh from a leading provider of maps, traffic and location data.	System Interface	Z	If this data is available for Garmin maps, RSI can look into the possibility of providing these items.
6.1.3.29	Utilize AVL data as a remote/virtual inspection force.	other	Y	Comply.
6.1.3.30	Notify system administrator that a vehicle needs regeneration.	Report	Y	Comply. As an option, the RSI mobile Unit can be connected to any sensor signals such as the engine diagnostics system. The RSI AVL system has a preventative maintenance feature that manages these and other vehicle maintenance issues
6.1.3.31	Vehicle operators can inform dispatch when the vehicle is idling for regeneration.	Decision Criteria	Y	Comply. The RSI Garmin Unit can be configured to provide a simple two-way messaging interface between the driver and AVL mapping operator. All messages sent by the driver are time and location tagged and can be used for a variety of status updates and activity reporting.
6.1.3.32	Run reports to validate vehicle regeneration calls.	Report	Y	Comply. The RSI AVL system comes with a suite of standard graphical and tabular reports that cover vehicle activities. RSI will work with the customer to supply a number of



				customized reports with the system. RSI uses industry standard database and reporting tools (Crystal Reports) so the customer can generate their own customized reports if desired.
6.1.3.33	Differentiate (color code) vehicles that are regenerating.	User Interface	Y	Comply. The vehicle icons may be configured by RSI to indicate (using colors, directional symbols, labels, and size) various vehicle attributes (such as ID, status, speed, idle vehicles, armlifts, etc.)
6.1.3.34	Track the status of a boom on boom trucks (e.g. Boom - up or Boom - down).	System Interface	Y	Comply. The RSI Mobile Unit will be connected to the on-board vehicle power and any sensor signals to capture broom up/broom down. Reports can be generated to cover these vehicle activities.

6.1.4 PROCEDURE - Dump the vehicle

The vehicle is driven to pre-determined dump locations to off-load the carrying weight.

Reference #	Requirement	Requirement Type	Response (Y, Z, T, N)	Xrf
6.1.4.1	Notify when the load limits have been exceeded on dump trucks.	System interface	Z	Comply. If the vehicle has an electronic scale or some mechanism to create a load limit signal, the RSI Mobile Unit can capture that signal and send it.

6.1.5 PROCEDURE - Fuel the vehicle

The vehicle is driven to the pre-determined city fueling facilities (unless there is an emergency or special memo in vogue) if this is part of a process mandate (i.e. must fuel at the close of shift) or on an as needed basis.



Reference #	Requirement	Requirement Type	Response (Y, Z, T, N)	Xrf
6.1.5.1	Integrate with a fuel system. The City uses OPW Petro Vend's 800™ Fuel Control System for centralized control of our fueling operations. We use OPW's Phoenix™ software to import and update fuel data from Petro Vend.	System interface	Y	Comply. RSI is able to leverage its vast engineering experience to allow for the easy integration and real time sharing of all system data with third party applications. We can interface data using a variety of methods such as TCP/IP, SOAP, XML, Web Services, etc. Interfacing can have additional costs from both RSI and your vendors, which are not included.
6.1.5.2	Validate that the vehicle is authorized to fuel at a specific facility. The City uses OPW Petro Vend's K800™ Fuel Control System for centralized control of our fueling operations. We use OPW's Phoenix™ software to import and update fuel data from Petro Vend.	User interface	Y	Comply. RSI AVL has geofences that can simply compare if a vehicle is part of an authorized group for individual fueling facilities.

6.1.6 PROCEDURE - Set salt application rate on the vehicle

We use FORCE® America equipment on our salting vehicles. The driver sets the pre-approved salt application rate. The management staff makes this call with the knowledge of the road surface temperatures that they can get from the sensors on the vehicles.

Reference #	Requirement	Requirement Type	Response (Y, Z, T, N)	Xrf
6.1.6.1	Monitor salting rate and determine amount left. The City uses FORCE® America's SSC5100 salt spreader controls to manage the distribution and application of anti-icing materials	System Interface	Y	Comply. RSI has worked with Force America and interfaced to their controllers before. Force America may require additional fees or items to configure the spreaders to produce the desired data



	during winter operations. The Vendor must integrate their solution with FORCE® America.			stream. These potential items are not included in the base price.
6.1.6.2	Monitor salt spreader gate status (open/closed). The City uses FORCE® America's SSC5100 salt spreader controls to manage the distribution and application of antiicing materials during winter operations. The Vendor must integrate their solution with FORCE® America.	System Interface	Y	Comply. RSI has worked with Force America and interfaced to their controllers before. Force America may require additional fees or items to configure the spreaders to produce the desired data stream. These potential items are not included in the base price.
6.1.6.3	Flag the system with an empty salt truck. The City uses FORCE® America's SSC5100 salt spreader controls to manage the distribution and application of anti-icing materials during winter operations. The Vendor must integrate their solution with FORCE® America.	User Interface	Y	Comply. RSI has worked with Force America and interfaced to their controllers before. Force America may require additional fees or items to configure the spreaders to produce the desired data stream. These potential items are not included in the base price.

6.1.7 PROCEDURE - Plow and/or salt streets with the vehicle

During the winter months, equipment operators drive thru the city streets performing plowing and salting operations. Any truck with a plow, or vehicles with salt bodies, can be used for this purpose.

Reference #	Requirement	Requirement Type	Response (Y, Z, T, N)	Xrf
6.1.7.1	Monitor salting rate and determine amount left. The City uses FORCE® America's SSC5100 salt spreader controls to manage the distribution and application of anti-icing materials during winter operations. The Vendor must integrate their solution with FORCE® America.	User interface	Y	Comply. RSI has worked with Force America and interfaced to their controllers before. Force America may require additional fees or items to configure the spreaders to produce the desired data stream. These potential items are not included in the base price.
6.1.7.2	Track the status of a plow (e.g. Plow - up or plow - down). The City uses FORCE® America's vehicle equipment to control and	System Interface	Y	Comply. RSI can monitor the status of plow up or down. RSI has worked with Force America and interfaced to their



	manage roadway plowing during winter operations. The Vendor must be able to integrate their solution with FORCE® America.			controllers before. Force America may require additional fees or items to configure the spreaders to produce the desired data stream. These potential items are not included in the base price.
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6.1.8 PROCEDURE - Sweep streets with the vehicle

From May through October, equipment operators drive thru the city streets performing sweeping and flushing operations.

Reference #	Requirement	Requirement Type	Response (Y, Z, T, N)	Xrf
6.1.8.1	Track and report the level of water in the water tank of sweepers. The City uses Elgin Pelican® Three-Wheel Broom Sweepers (mix of mechanical and hydraulic) and Elgin Crosswind® 4 Wheel Regenerative Air Sweepers. The vendor must be able to integrate their solution with Elgin vehicle equipment.	System Interface	Y	Comply. The RSI Mobile Unit can be connected to any sensor signals to capture various data streams from the device. Reports can be generated to cover these vehicle activities. If the appropriate data streams are made available by Elgin, then the RSI Mobile Unit can capture and send them. Elgin may require additional fees for this and they are not included.
6.1.8.2	Track the status of the water flow on sweepers (e.g. water flow on or water flow off). The City uses Elgin Pelican® Three-Wheel Broom Sweepers (mix of mechanical and hydraulic) and Elgin Crosswind® 4 Wheel Regenerative Air Sweepers. The vendor must be able to integrate their solution with Elgin vehicle equipment.	System Interface	Y	Comply. See above
6.1.8.3	Track the filter status on sweepers (check if filter is clogged or needs replacement). The City uses Elgin Pelican® Three-Wheel Broom	System Interface	Y	Comply. See above



	Sweepers (mix of mechanical and hydraulic) and Elgin Crosswind® 4 Wheel Regenerative Air Sweepers. The vendor must be able to integrate their solution with Elgin vehicle equipment.			
6.1.8.4	Track the status of the debris hopper on sweepers (check if hopper is full). The City uses Elgin Pelican® Three- Wheel Broom Sweepers (mix of mechanical and hydraulic) and Elgin Crosswind®4 Wheel Regenerative Air Sweepers. The vendor must be able to integrate their solution with Elgin vehicle equipment.	System Interface	Y	Comply. See above
6.1.8.5	Track the status of a broom on sweepers (e.g. Broom - up or Broom - down) independently for curb-side and street-side brooms. The City uses Elgin Pelican® Three-Wheel Broom Sweepers (mix of mechanical and hydraulic) and Elgin Crosswind®4 Wheel Regenerative Air Sweepers. The vendor must be able to integrate their solution with Elgin vehicle equipment.	System Interface	Y	Comply. See above

6.1.9 PROCEDURE - Park the vehicle

The vehicle will be returned to its starting point by default to park vehicle. If the driver identifies or suspects a mechanical issue with the vehicle, he drives to the Central Vehicle Maintenance Facility (CVMF) and parks it for service in the lot.

Reference #	Requirement	Requirement Type	Response (Y, Z, T, N)	Xrf
6.1.9.1	Transmit a specific signal from the vehicle indicating that the vehicle is parked for service.	User Interface	Y	Comply. We can set a geofence at the CVMF.



6.1.10 PROCEDURE - Dispatch City vehicles for contractor routes with breakdowns

When a contractor calls in a breakdown, these routes will be covered with a vehicle from the City fleet.

Reference #	Requirement	Requirement Type	Response (Y, Z, T, N)	Xrf
6.1.10.1	Add a vehicle to a different group (e.g. add an arterial vehicle under contracted snow plowing).	User Interface	Y	Comply. The RSI AVL system is highly customizable and allows the user to add/edit/remove vehicle units and users.
6.1.10.2	Differentiate this route from all other normal routes under this group / activity	User Interface	Y	Comply. RSI can place any vehicle into a specific group/subgroup.
6.1.10.3	Track the status of a plow (e.g. Plow - up or plow - down). The City uses FORCE® America's vehicle equipment to control and manage roadway plowing during winter operations. The Vendor must be able to integrate their solution with FORCE® America.	System Interface	Y	Comply. RSI has worked with Force America and interfaced to their controllers before. Force America may require additional fees or items to configure the spreaders to produce the desired data stream. These potential items are not included in the base price.

6.2 OBJECT - Maps

The map object can be any physical or electronic maps used by equipment operators to reference their route, route sequence or a single location.

6.2.1 PROCEDURE - Review the map to determine route sequence

The equipment operator refers to map data to determine best route, next address in sequence etc.

Reference #	Requirement	Requirement Type	Response (Y, Z, T, N)	Xrf
6.2.1.1	Display a map interface on the onboard dashboard. We require ArcGIS 10 or a comparable map interface using the City's existing map layers and or routes for the different services/operations so we can track operations in a route	User interface	Y	Comply. The RSI AVL application is based on the actual ESRI ArcGIS Server software, but no additional licenses are needed by the customer. The RSI AVL system can use virtually any type of map data, but



	centric or service centric format.			in particular our software can overlay our AVL information on your own ESRI GIS maps. RSI allows you to utilize your existing investment of time and labor that went into your ESRI map data. The RSI AVL system relates real-time vehicle location and status data to the infrastructure, assets, boundaries, updates, routes, parcels, landmarks, and other critical elements of your constantly changing GIS map data.
6.2.1.2	Resolve address on work request and plot on map. The address could come from our work order system, so we require that the AVL solution be able to resolve address information and geo reference the address provided by the work order system, in various possible address formats.	Other	Y	Comply. RSI is able to leverage its vast engineering experience to allow for the easy integration and real time sharing of all system data with third party applications. We can interface data using a variety of methods such as TCP/IP, SOAP, XML, Web Services, etc. Integrating to a third party system will require collaboration with their programmers to insure a proper data stream is created and available. Additional costs may be required.
6.2.1.3	Display route to work location. Possible use of turn by turn navigation with spoken and visual instructions.	System Interface	Y	Comply. The optional RSI customized Garmin Unit also retains its core Garmin navigation functionality that provides voice guided turn by turn directions to the desired destination.
6.2.1.4	Update route to accommodate dynamic work request changes. Routesmart® or use of the in-built routing software.	System Interface	Z	RSI AVL is not a routing system. RSI AVL can provide vehicle location and status to the Route Smart routing system. Additional costs may be



				required.
6.2.1.5	Plot work locations on the map when on route. If the driver observes a situation needing attention, they can mark the location of work on a map available on the on-board display which then gets delivered to dispatch at regular intervals for further research and assignment.	User Interface	Y	Comply. In the vehicle, the optional RSI Garmin Unit allows the mobile user to send specific status messages such as “pot hole” or “sign damaged” that can be sent back to the base for further action.
6.2.1.6	Switch between weather maps and geo-fences to help make decisions.	User Interface	Z	Comply. If weather data is made available to RSI in ESRI Map Services format or other format, we can overlay them as a layer.
6.2.1.7	Configure the unit to provide turn by turn directions with a map display.	User Interface	Y	Comply. The customized Garmin messaging and navigation terminal offers turn by turn directions to a destination or can also accept customized routes.

6.2.2 PROCEDURE - Monitor the contractor vehicle location for compliance

The contractors are assigned specific routes and are monitored for route compliance (e.g. they cannot deter from the route boundaries when a route is in progress).

Reference #	Requirement	Requirement Type	Response (Y,Z,T,N)	Xrf
6.2.2.1	Determine all vehicles are at their respective start points.	Report	Y	Comply.
6.2.2.2	Verify that a contract vehicle is within the geo-fenced area when the activity is in progress.	User Interface	Y	Comply. The map window can be set to display a particular area, route, stop, or address, or to track a specific sub-set of the entire fleet (from the entire fleet to an individual vehicle).

6.3 OBJECT - Work Requests

A work request is a record / form / document describing the work to be done and furnishes information about the work location, route etc. as well. This can be generated from several different systems in the city including LAGAN, Maintain-IT, Mainframe etc.

6.3.1 PROCEDURE - Review the work request to determine work to be completed

The equipment operator reads through a work request to determine the location where work needs to be performed.



Reference #	Requirement	Requirement Type	Response (Y,Z,T,N)	Xrf
6.3.1.1	Access work request from an onboard display.	User Interface	N/Y/Z	With customized development, RSI can integrate the system to push work orders to a more advanced driver interface in the vehicle, such as a tablet or laptop with customized software. This will require interfacing the back end to the work order management system as well as an appropriate driver interface in the vehicle. RSI will work with the City to determine specific functionality and devices.
6.3.1.2	Make modifications to work request and track changes.	User Interface	N/Y/Z	See above.
6.3.1.3	Dynamically add work request to existing work queues.	User Interface	N/Y/Z	See above.
6.3.1.4	Integrate a work order/complaint management system within, or as a complement to, an AVL solution.	System Interface	N/Y/Z	See above.

6.3.2 PROCEDURE - Create the work request

Depending on the source of the work request, different personnel can create work requests in the system if they are assigned permissions to do so.

Reference #	Requirement	Requirement Type	Response (Y,Z,T,N)	Xrf
6.3.2.1	Set up an activity in the AVL system to reflect the crew performing work requests for the day.	Other	N	The RSI AVL system is not a Work Order management system. However, if integrated, the AVL system can reflect which vehicles are assigned to specific work orders etc.

6.3.3 PROCEDURE - Notify on the work request status



Inform dispatch about the status of a work request and/or provide updates.

Reference #	Requirement	Requirement Type	Response (Y,Z,T,N)	Xrf
6.3.3.1	Readily integrate spatial and, where applicable, vehicle status data gathered through the AVL system into LAGAN, the customer relationship management software utilized by 311.	System Interface	Y	<p>Comply. RSI is able to leverage its vast engineering experience to allow for the easy integration and real time sharing of all system data with third party applications. We can interface data using a variety of methods such as TCP/IP, SOAP, XML, Web Services, etc.</p> <p>Interfacing can have additional costs from both RSI and your vendors, which are not included.</p>

6.3.4 PROCEDURE - Update the work request

Update the work request with notes and status updates provided by field personnel.

Reference #	Requirement	Requirement Type	Response (Y,Z,T,N)	Xrf
6.3.4.1	Readily integrate spatial and, where applicable, vehicle status data gathered through the AVL system into LAGAN, the customer relationship management software utilized by 311.	System Interface	Y	<p>Comply. RSI is able to leverage its vast engineering experience to allow for the easy integration and real time sharing of all system data with third party applications. We can interface data using a variety of methods such as TCP/IP, SOAP, XML, Web Services, etc.</p> <p>Interfacing can have additional costs from both RSI and your vendors, which are not included.</p>
6.3.4.2	Capture the percentage of a given route completed.	Decision Criteria	Y/Z/N	<p>Comply. If given the route data, RSI can show the vehicle path relative to the planned route. This is an optional customization.</p>



6.4 OBJECT - Dispatch Records

A dispatch record is an entry in the Dispatch System which is an MS Access based system. This system has the ability to track the progress in snow and ice related activities like plowing, salting, towing and more.

6.4.1 PROCEDURE - Dispatch the vehicle

The dispatcher in every area will assign a specific vehicle to a route depending on the activity to be performed.

Reference #	Requirement	Requirement Type	Response (Y,Z,T,N)	Xrf
6.4.1.1	Interface with the data in the dispatch system.	System Interface	Y/Z/N	<p>Comply. RSI is able to leverage its vast engineering experience to allow for the easy integration and real time sharing of all system data with third party applications. We can interface data using a variety of methods such as TCP/IP, SOAP, XML, Web Services, etc.</p> <p>Interfacing can have additional costs from both RSI and your vendors, which are not included.</p>
6.4.1.2	Track all the information currently stored in the dispatch system.	Other	Y/Z/N	See above
6.4.1.3	Differentiate a dispatched vehicle from a vehicle in a lot.	User Interface	Y/Z/N	See above

6.4.2 PROCEDURE - Update the dispatch information

Make notes and change the status of an on-going activity in the dispatch system.

Reference #	Requirement	Requirement Type	Response (Y,Z,T,N)	Xrf
6.4.2.1	Equipment operator can update the dispatch system.	Business Form	Z/N	With customized development, RSI can integrate the system to push work orders to a more advanced driver interface in the vehicle, such as a tablet or



				laptop with customized software. This will require interfacing the back end to the work order management system as well as an appropriate driver interface in the vehicle. RSI will work with the City to determine specific functionality and devices.
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6.4.3 PROCEDURE - Notify on the route status

Inform dispatch about the status of an activity or provide updates.

Reference #	Requirement	Requirement Type	Response (Y,Z,T,N)	Xrf
6.4.3.1	Have two way communications between the vehicles and dispatch (e.g. messaging, radio).	Other	Y	The RSI Garmin Unit can be configured to provide a simple two-way messaging interface between the driver and AVL mapping operator. All messages sent by the driver are time and location tagged and can be used for a variety of status updates and activity reporting.

6.4.4 PROCEDURE - Create the dispatch information

Create a record in the dispatch system capturing the details of an activity and recording its start.

Reference #	Requirement	Requirement Type	Response (Y,Z,T,N)	Xrf
6.4.4.1	Set up an activity in the AVL system to reflect the dispatch information.	Other	Y/Z/N	Comply. RSI is able to leverage its vast engineering experience to allow for the easy integration and real time sharing of all system data with third party applications. We can interface data using a variety of methods such as TCP/IP, SOAP, XML, Web Services, etc. Interfacing can have



additional costs from both RSI and your vendors, which are not included.

6.5 OBJECT - Geodatabases

A geodatabase is a data repository for spatial data storage and management.

6.5.1 PROCEDURE - Update the geodatabase with run information

Export route data from a web-based system and import it into a geodatabase for persistent storage.

Reference #	Requirement	Requirement Type	Response (Y,Z,T,N)	Xrf
6.5.1.1	Export historic AVL data into a commercial GIS environment for subsequent analysis. The City of Rochester has a centralized GIS using software products from Environmental Systems Research Institute (ESRI). Currently, ESRI® ArcView9.x client software is installed on desktop workstations throughout the City of Rochester. Central data storage of geographic data files is housed using ArcSDE and ArcIMS v4.0.	System Interface	Y	Comply. The RSI AVL application is based on the actual ESRI ArcGIS Server software, but no licenses are needed by the customer. The RSI AVL system can use virtually any type of map data, but in particular our software can overlay our AVL information on your own ESRI GIS maps. The RSI AVL system relates real-time vehicle location and status data to the infrastructure, assets, boundaries, updates, routes, parcels, landmarks, and other critical elements of your constantly changing GIS map data. RSI has extensive experience working with ESRI data and environments in all forms (.shp files, SDE, etc.). As an option, RSI can actually access your GIS map data in real time via Map Services.

SECTION 7 – Technical Requirements

This section of the document defines the technical requirements for the proposed system which address architecture, data, security, and system interfaces.

7.1 Architecture

The purpose for the Architecture is to depict the technical elements that come into play within an



informational system, in order to permit the applications to function smoothly with little or no downtime. It also functions as the baseline or foundation for which the applications reside and depend upon.

Reference #	Requirement	Response (Y,Z,T,N)	Xrf
7.1.1	Provide architecture that is modular, scalable, and extensible.	Y	Comply.
7.1.2	Reside on any standard hardware platform and operating system (not proprietary).	Y	Comply.
7.1.3	Host the solution for the City of Rochester.	Y	Comply. The RSI AVL system is accessed via the Internet Explorer web browser using unique login and password. The RSI Base server is based on SQL Server and manages all fleet data and archives and distributes the vehicle location and status information. Base servers can be either hosted by RSI or on-premise at the customer site. Through customization, data can be sent or streamed virtually anywhere for customer access in virtually any format (ie. TCP/IP, ESRI Map Services, Web Services, etc.)
7.1.4	Provide a detailed plan with costing and assist in implementing the same if the City of Rochester decides to host the solution.	Y	Comply. We have systems both hosted and local, and can be migrated either way.
7.1.5	Provide an always connected wireless data network.	Y	Comply. RSI can use virtually any wireless carrier for the communications portion of this system. The RSI AVL system can support mobile units using multiple different carriers and technologies. RSI is proposing AT&T as the default but can use Verizon or Sprint as an option.
7.1.6	Provide a satellite communication network for areas where ground-based wireless communications is weak.	Y/T	RSI can optionally provide hybrid units that use a variety of communications networks. Our mobile units can support any combination of: cellular, satellite, , WiFi, and several others. RSI has unparalleled experience in the design and implementation of these complicated customized hybrid systems.



7.1.7	Receive and forward position information from the vehicle's satellite transmitter.	Y/T	See previous answer.
7.1.8	Ability for two-way mobile messaging to allow email messaging to and from the driver over the Internet wireless communications link.	Y	Comply. The optional RSI Garmin Unit can be configured to provide a simple two-way messaging interface between the driver and AVL mapping operator. All messages sent by the driver are time and location tagged and can be used for a variety of status updates and activity reporting.
7.1.9	Send information via satellite, nationwide cellular network or radio frequency — or a combination thereof.	Y	Comply. For this initial RFP RSI is proposing the use cellular based wireless technologies. RSI can offer several options for wireless communications including cellular (GPRS/GSM/EDGE, CDMA, high speed broad band, etc), WiFi, satellite (Iridium, Inmarsat), and two-way radio (AVL data dedicated systems). RSI can highly customize the system beyond the scope of the RFP in future phases.
7.1.10	Provide data transmission without recurring or monthly costs.	Y	If desired, RSI can provide a passive WiFi based system that does not have recurring data transmission costs. This would not be real time and would require significant additional WiFi infrastructure on site.
7.1.11	Demonstrate experience with integrated AVL/GPS systems.	Y	Comply. See Experience.
7.1.12	Evolve with new technologies to meet future needs as they arise.	Y	Comply.
7.1.13	Perform a complete historic data recovery and reporting during an event of hardware failure or network failure emergencies.	Y	Comply. RSI hosts its servers in a state of the art server farm facility with industry standard back up and recovery practices in place. RSI typically archives all data indefinitely and keep about 6 months of data live for reporting. Specific dates from historical data can be restored upon request. The RSI Base server is based on SQL Server and we can arrange to have periodic FTP data transfers to the City of raw SQL tables for historical archiving.
7.1.14	Provide an open API to make integration processes.	Y	RSI does not publish an official API but we can interface and provide our data in virtually any format and protocol for the other system. We can interface data using a variety of methods such as TCP/IP, SOAP, XML, Web Services, etc.



7.1.15	Provide seamless integration to PC based MS® Office products.	Y	Comply. The RSI AVL system uses Microsoft operating system and products and is accessed via the Internet Explorer web browser. Reports can be exported to Word and Excel.
7.1.16	Operate on most current version of Internet Explorer.	Y	Comply. The RSI AVL system is accessed via the Internet Explorer web browser 7 or higher using unique login and password.
7.1.17	Use HTTPS and other secure means of data transmission including data encryption.	Y	Comply.
7.1.18	Interface with standard languages and protocols (not proprietary).	Y	Comply.
7.1.19	Configure software from an administrator point of view, with full audit of any configuration change captured.	Y	Software can be configured by system administrators with proper authority and access. Software changes are typically done by RSI.
7.1.20	Support full software change control process with check-in and check-outs.	Y	Comply.
7.1.21	Interface with Microsoft® SQL Server 2005 or higher.	Y	Comply. The RSI Base server is based on SQL Server and manages all fleet data and archives. Access to parallel SQL tables can be made available.
7.1.22	Provide complete on line documentation including: Installation/Set-up & Configuration, Training/Tutorial, Application, Process Flow and Reference.	Y	Comply. Documents will be provided in hard and electronic copy.
7.1.23	Define alerts at the user level to notify specified individuals or groups when triggered by an event.	Y	Comply. The RSI AVL system allows authorized administrators extensive control over system features including alerts and alarms. The system can be configured to notify selected users when specific events occur with any of the vehicles. This includes geofences, hours of operation, idle, panic buttons, etc. Notifications can be sent as an e-mail, SMS, or to the alert screen on the software.
7.1.24	Set-up alerts across all modules.	Y	Comply. The system can be configured to notify selected users when specific events occur with any of the vehicles. This includes geofences, hours of operation, idle, panic buttons, etc. Notifications can be sent as an e-mail, SMS, or to the alert screen on the software



7.1.25	Set-up and receive administrative notification of specific activities that may not require user intervention (System Alerts).	Y	Comply.
7.1.26	Interface with the following to provide notifications: MS® Outlook Exchange email and PDAs.	Y	Comply.
7.1.27	Remotely manage the environment from a Vendor or City IT perspective using a web interface.	Y	Comply.

7.2 Data Requirements

Reference #	Requirement	Response (Y,Z,T,N)	Xrf
7.2.1	Display dates in the USA format.	Y	Comply.
7.2.2	Support the translation of views and instructions into multiple languages (e.g. English, Spanish).	N	RSI can work with the City on special requests for optional translation.
7.2.3	Provide Entity Relationship Diagrams (ERD) showing layout of tables, fields and data entity relationships.	Y	Comply.
7.2.4	Provide data dictionary with ability to interface electronically to industry standard reporting environments (i.e. Microsoft® business intelligence).	Y	Comply.
7.2.5	Provide numerous user definable fields in every table that will be used by the application.		Comply.
7.2.6	Automatically archive and purge data per retention periods.		Comply. RSI typically keeps about 6months of data live for instant access, and indefinitely stores all historical data. Historical data can be transferred to the customer on a periodic basis using FTP or other methods.



7.3 System Administration, Security and Audits

Reference #	Requirement	Response (Y,Z,T,N)	Xrf
7.3.1	Authenticate a person's credentials through Windows Active Directory®.	Y	If the system is hosted locally by the City, the RSI AVL system can be configured to operate with Active Directory
7.3.2	Easily set-up and maintain users within functional groups that can be nested, taking on the parents rights and restricting that further.	Y	Comply. The RSI AVL system can support unlimited simultaneous users. The RSI AVL System provides for multiple access levels for users. The RSI system can be configured so that specific users only have access to specific functionality or vehicle information.
7.3.3	Effect Site/Group-level security (user can view site specific data or multi-site data based on security preferences assigned).	Y	Comply. The RSI AVL system can support unlimited simultaneous users. The RSI AVL System provides for multiple access levels for users. The RSI system can be configured so that specific users only have access to specific functionality or vehicle information.
7.3.4	Effect Site/Group-Specific security configuration per user (user security access may differ from site to site).	Y	Comply. The RSI AVL system can support unlimited simultaneous users. The RSI AVL System provides for multiple access levels for users. The RSI system can be configured so that specific users only have access to specific functionality or vehicle information.
7.3.5	Define read/select, insert, update, and delete in any combination or set for Module/Function/Field for any Group or Individual in an easy to maintain way.	Y	Comply. The RSI AVL system is highly customizable and allows the user to add/edit/remove vehicle units and users.
7.3.6	Produce reports which identify who has access to run reports, audit trail log depicting report additions, deletions or changes noting the user who made, time and date stamp.	Y	Comply. The RSI system monitors user activity.
7.3.7	Capture a before and after snapshot of data (audit trails) that changes within a system in a text based, non-system specific, human readable format. This should not hinder system performance, and be configurable and user friendly.	Y	
7.3.8	Capture when reports are printed and noting the user, time and date stamp.	Y	Comply.
7.3.9	Capture when reports are viewed and noting the user, time and date stamp.	Y	Comply.



7.3.10	Limit access to information based on security level.	Y	Comply. The RSI AVL System provides for multiple access levels for users based on login. Certain privileged users will have the ability to adjust parameters for the AVL system and to configure certain system functions, while others will have limited functionality. The RSI system can be configured so that specific users only have access to specific functionality or vehicle information.
7.3.11	Display fields based on security level.	Y	Comply. The RSI AVL System provides for multiple access levels for users based on login. Certain privileged users will have the ability to adjust parameters for the AVL system and to configure certain system functions, while others will have limited functionality. The RSI system can be configured so that specific users only have access to specific functionality or vehicle information.
7.3.12	Limit editing capability to the record creator & security level.	Y	Comply. The RSI AVL System provides for multiple access levels for users based on login. Certain privileged users will have the ability to adjust parameters for the AVL system and to configure certain system functions, while others will have limited functionality. The RSI system can be configured so that specific users only have access to specific functionality or vehicle information.
7.3.13	Customize the software based on the end-user's role in the system.	Y	Comply. The RSI AVL System provides for multiple access levels for users based on login. Certain privileged users will have the ability to adjust parameters for the AVL system and to configure certain system functions, while others will have limited functionality. The RSI system can be configured so that specific users only have access to specific functionality or vehicle information.
7.3.14	Restrict the vehicle groups that a specific end user can see.	Y	Comply. The RSI AVL System provides for multiple access levels for users based on login. Certain privileged users will have the ability to adjust parameters for the AVL system and to configure certain system functions, while others will have limited functionality. The RSI system can be configured so that specific users only have access to specific functionality or vehicle information.
7.3.15	Restrict vehicle routes that a specific end user can see.	Y	Comply. The RSI AVL System provides for multiple access levels for users based on login. Certain privileged users will



		<p>have the ability to adjust parameters for the AVL system and to configure certain system functions, while others will have limited functionality. The RSI system can be configured so that specific users only have access to specific functionality or vehicle information.</p>
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7.4 System Interfaces

The purpose of this section of the document is to provide easy access between independent and disparate systems and assure accuracy in the transfer of data between them. Describe in the response how interfaces will be addressed in the recommended solution. For example, are Application Program Interfaces (API's) used or will interfaces be developed on a case-by-case basis. In addition, identify if interfaces have been implemented with existing customers and what type of applications have been interfaced.

The vendor should provide a diagram that visually shows all integration points in their proposed solution, as well as any other vendors' product recommended to meet the requirements of this RFP.

In addition, the vendor should describe its technical strategy to actively integrate to other vendors' products or existing City in-house systems described in Section 5 – *Legacy Systems Environment* that fulfill the City of Rochester's functional needs outside the scope of this RFP.

RSI Note: Using the “response value” codes for some of these requirements did not enable us to accurately answer or convey our ability to meet the specification. There are many specifications that we are capable of meeting, however we have no detailed information on the specification to enable us to accurately price or gauge the custom work needed. In particular this affects our answers for interfacing to third party applications- which we specialize in, but we need more information from you.

Since the “Y” code means there is no additional cost, we thought it unwise to use this since that is always a possibility. The “Z” code also infers that there is no additional cost. The “N” code states that we unable to do it, even with customization- which is not accurate either.

We highly encourage the City to engage us in conversation to more accurately gauge our high level of capability in the area of third party interfacing and customized AVL systems.



Reference #	Requirement	Response (Y,Z,T,N)	Xrf
7.4.1	Interface with other software products owned by the vendor but which are in another family to meet a need that does not exist in the standard product, regardless of what platform that product may reside on.	Y	Comply. RSI is able to leverage its vast engineering experience to allow for the easy integration and real-time sharing of all system data with third party applications. In addition, the RSI AVL system provides a wireless gateway for these systems to share and update data from a driver interface in the vehicle. RSI has written interface programs specific to a number of such applications (using methods such as COM/DCOM, ODBC, XML, SOAP, TCP/IP sockets, CORBA, data queues in an AS/400 environment, network files, etc.).
7.4.2	Provide plug-in designs that do not require special coding.	Y	RSI AVL can send and receive data with easily configured Web and Map Services.
7.4.3	Interface with third party sources of information via a Web Service call.	Y	Comply RSI is able to leverage its vast engineering experience to allow for the easy integration and real time sharing of all system data with third party applications. We can interface data using a variety of methods such as TCP/IP, SOAP, XML, Map Services, etc.
7.4.4	Perform data imports and exports from and to both desktop and applications running on other processors.	Y	Comply.
7.4.5	Interface seamlessly with barcode and other data collection devices.	Y	Comply.
7.4.6	Interface with HID smart cards attached to user profiles.	Y	Comply.
7.4.7	Provide remote help desk support via telephone and live on-screen control.	Y	Comply. RSI will either phone support or remote access support (WebEx) to help ensure smooth operation of the system. See Service Response plan.



BASIC IN-VEHICLE EQUIPMENT

quantity		per unit	total
100	RSI MOBILE UNITS (AT&T GPRS) <i>Mobile Units Configured for public data network (GPRS)</i> <i>Includes: GPS/RF Antennas, Mount, and Cabling</i> <i>Includes capability for 5 sensor inputs</i> <i>For Verizon or Sprint, add \$95 per unit.</i>	\$ 295 each	\$ 29,500

MONTHLY WEB TRACKING SERVICE FEES

quantity		per unit	total
100	RSI AVL WEB TRACKING SERVICE FEES (per Month) RSI AVL Web Browser Based ESRI ArcGIS Server Mapping & Reporting Includes wireless service and unlimited Web access. Service fees are charged per vehicle per month. Default update rate plus: ignition on/off, stops, starts, turns, and events.		
	Update Rate Options:	15 seconds \$ 38	
		30 seconds \$ 34	
		1 minute \$ 32	
		2 minutes \$ 30	
		5 minutes \$ 27	

SEE OPTIONS ATTACHED

IN-VEHICLE OPTIONS

quantity		per unit		total
100	MOBILE UNIT INSTALLATION PER VEHICLE	\$ 145	each	\$ 14,500
100	RSI CUSTOMIZED GARMIN NUVI MDTs w/ Navigation Customized messaging and navigation device <i>Includes Mount, Cabling, & Customization</i>	\$ 625	each	\$ 62,500
100	Interface to Force America Spreader Controllers	TBD	each	\$ -
100	Interface to Existing On-Vehicle Sensor/Device	\$ 25	each	\$ 2,500
100	ENGINE DIAGNOSTIC INTERFACE (Light Duty OBD-II)	\$ 75	each	\$ 7,500
100	ENGINE DIAGNOSTIC INTERFACE (Heavy Duty J-Bus)	\$ 150	each	\$ 15,000
100	WiFi/Cellular Hybrid Capability Add-On Added to standard device. Does not include necessary infrastructure/access points	\$ 250	each	\$ 25,000
100	Satellite/Cellular Hybrid Capability Add-On Added to standard device. Requires additional satellite data plan	\$ 750	each	\$ 75,000
100	RSI MOBILE UNIT (NON-MOTORIZED ASSET) Rugged Battery Unit for equipment/trailers	\$ 325	each	\$ 32,500
100	RSI MOBILE UNIT (High Speed 3G Data) <i>Requires different wireless plan.</i>	\$ 695	each	\$ 69,500
100	RF ID Reader (Driver ID)	\$ 295	each	\$ 29,500
100	Magnetic Card Stripe Reader	\$ 125	each	\$ 12,500
100	Emergency Buttons <i>Hard-wired On-Vehicle Button</i>	\$ 95	each	\$ 9,500
100	Emergency Buttons <i>Wireless Hand Held Medallion</i>	\$ 145	each	\$ 14,500
100	EXTENDED ANNUAL WARRANTY ON HARDWARE (per unit) <i>Past year one.</i>	\$ 25	each	\$ 2,500

SOFTWARE SYSTEM OPTIONS

quantity		per unit			total
1	DAYS ONSITE SOFTWARE SYSTEM TRAINING <i>Does not include travel</i>	\$	1,000	each	\$ 1,000
1	DAYS ONSITE MOBILE UNIT INSTALLATION TRAINING <i>Does not include travel</i>	\$	1,000	each	\$ 1,000
1	DATA INTERFACE TO FLEET MANAGEMENT SYSTEM <i>We are fully capable, but more specification is needed</i>	TBD		each	\$ -
1	DATA INTERFACE TO WORK ORDER MANAGEMENT SYSTEM <i>We are fully capable, but more specification is needed</i>	TBD		each	\$ -
1	DATA INTERFACE TO DISPATCH SYSTEM <i>We are fully capable, but more specification is needed</i>	TBD		each	\$ -
1	DATA INTERFACE TO FUELING SYSTEM <i>We are fully capable, but more specification is needed</i>	TBD		each	\$ -
1	DATA INTERFACE TO ROUTING SYSTEM <i>We are fully capable, but more specification is needed</i>	TBD		each	\$ -
1	PUBLIC WEB INTERFACE Depends on level and specifics of configuration	TBD		each	\$ -
1	LOT TRAVEL	TBD		each	\$ -
1	LOT SHIPPING	TBD		each	\$ -

CONFIDENTIAL

*Service Fees to be paid annually in advance.
Does not include applicable sales tax.
Includes all manuals and documentation
Does not include travel/lodging
FOB Torrance, CA*