



Information Technology Infrastructure
Investment Fund Proposal

For

Automatic Vehicle Location (AVL) Mapping

September 2008

Project Title

Automatic Vehicle Locations (AVL) Mapping

Project Leaders

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Background

Automatic vehicle location or **AVL** is a means for determining the geographic location of a moving person, object, or vehicle and sending this information to a point where it can be used.

It is a powerful tool for managing fleets of vehicles, from service vehicles, emergency vehicles, and construction equipment, to public transport vehicles (buses and trains). It also is used to track mobile remote assets, such as construction equipment, trailers, and portable power generators. Increasingly, it is being used to more effectively manage a large staff, track probationers and sex offenders, and support dispatch operations.

For example, suppose an ambulance fleet has an objective of arriving at the location of a call for service within six minutes of receiving the request. Using an AVL system allows dispatch personnel to evaluate the locations of all vehicles in a fleet in order to pick the vehicle that will most likely get there fastest, meeting the service objective.

AVL is not only used to locate assets, but through connections to the vehicle, also obtain information about engine data, fuel consumption, driver data such as speed and sensor data from i.e. doors, airbag deployment, etc.

The purpose of the AVL/Mobile Asset Tracking Pilot is to demonstrate the costs and benefits of an internet mapping solution for tracking, managing, searching and reporting on mobile assets.

For the pilot, Latitude Geographics will provide and implement software to track a number of fixed mount, in-vehicle GPS units connected via cellular network. The units selected are unique because they will also serve as a **mobile WiFi hotspot** providing internet access for units within the car, opening up opportunities for data access in a mobile environment.

A web mapping application will show the location of these assets on a map, provide current status information, and provide historical reporting. This application is a low-cost add-on to

existing web applications hosted at ISD on the Enterprise GIS Infrastructure, which will reduce cost and implementation time.

Six County departments listed below are members of this pilot. The table below shows the departments that are part of the project, the project manager, and details on how they plan to use the pilot and the benefits they expect to gain from AVL.

Upon successful completion, all county departments will be able to leverage the knowledge and systems developed during the pilot to leverage the benefits of AVL.

Department	Project Manager	Description
Probation	Thida Van Emergent Technologies Division Information Systems Bureau Contact : (562) 940-3173 Thida.Van@probation.lacounty.gov	Plan to deploy AVL in the following areas <ul style="list-style-type: none"> • Special Enforcement Officers (SEO) vehicle – provide safety to the Probation Officers by having immediate and continual access to vehicle location in high crime areas, immediately locate and direct nearby SEO vehicles to assist other Probation Officers in emergency operations. • Detention Service Bureau (DSB) transportation vehicles- Probation Officers transport Juveniles from Camp to Camp or from Juvenile Halls to Court for court appointments and other medical appointments. This will help the Transportation and Movement team to achieve public safety objectives by locating transportation vehicles, tracking it’s movement to provide alternative routes during routine or emergency operations and the ability to identify vehicles with abnormal travel pattern to take immediate action to ensure security of the Probation Officer and the Probationers.
Public Health	Michael Contreras Emergency Operations Coordinator Emergency Preparedness Response Program Contact: (213) 250-8186 micontreras@ph.lacounty.gov	Plan to deploy AVL in the following areas <ul style="list-style-type: none"> • Public Health Mobile vehicles – that are used routinely on programmatic or investigational site visits. • We intend to outfit these vehicles with the GPS and wifi enabled devices to

		<p>provide (1) vehicle tracking, and (2) workstation functions, such as printing, scanning, laptop operations with internet and/or Intranet support (via virtual private network).</p> <ul style="list-style-type: none"> • Beyond the pilot phase, our department intends to use these vehicles to demonstrate to programs with department vehicle its utility and compatibility with our information infrastructure.
<p>Children and Family Services</p>	<p>My Trinh GIS Division Information Technology Services Contact: (213) 351-5690 trinhn@dcfs.lacounty.gov</p>	<p>Plan to deploy AVL in the following areas</p> <ul style="list-style-type: none"> • The Department of Children and Family Services (DCFS) Juvenile Court Transportation and Shelter Care Section that coordinates the transportation of children from designated pick-up locations to the specified court house and drop-off locations. • The Automated Vehicle Locator (AVL) enables the Transportation Unit Supervisors to monitor the transportation worker's: <ul style="list-style-type: none"> • real-time vehicle location, • vehicle status, • historical movements of the vehicle to track for route efficiency, • nearest vehicle to an address or to another vehicle for pick-up or drop-off assignments, • time reporting to see if the drivers are using their time wisely, • mileage reporting, • thief recovery. • The AVL technologies will be further integrated with existing routing software to create a comprehensive passenger routing and transportation assignment system.

Community Development Commission	Michael Chong Information Technology Unit Administrative Services Division Contact : (323) 890-7218 Michael.Chong@lacdc.org	Plans to deploy AVL in the following areas <ul style="list-style-type: none"> • Maintenance Service Vehicles to reduce fuel costs and increase worker productivity • Inspection Vehicles to ensure that the inspectors obey traffic safety laws and to ensure their physical safety.
Mental Health	Vandana Joshi Quality Improvement and Training Division– Data Unit Contact : (213) 251-6886 VJoshi@dmh.lacounty.gov	Plans to deploy AVL in the following area <ul style="list-style-type: none"> • DMH Psychiatric Mobile Response Teams (PMRT team) to enhance the response times that support the DMH Access Center. PMRT team provides emergency response to approximately 285,000 calls each year. The effectiveness of these services depends heavily on how soon they are able to reach the location and prepare any follow-ups associated with the visit. The AVL deployment will help us test the timeliness of our services and eventually its impact on improving our services.
Registrar Recorder/County Clerk	Kenneth Bennett Registrar-Recorder/County Clerk Precincting, GIS & Election Tally Systems Division Technical Services Bureau Contact: (562) 462-2704 E-mail: kbennett@rrcc.lacounty.gov	Plans to deploy AVL in the following area <ul style="list-style-type: none"> • Field Representative vehicles – to track its locations in Polls & Officers Section, • Provide them with mobile Internet access so they can remotely connect to our Poll Recruitment Support and other election systems

Project Description

Project funding of **\$91,870.33** will be used as follows:

- \$34,988.48 to acquire and install 20 vehicle-mounted GPS units and one year of wireless connectivity.
- \$15,000 to acquire the Fleet Tracker for Geocortex IMF and LTI Wireless Data Server to receive GPS signals from up to 50 mobile devices.
- \$8,700 for Latitude Geographics software installation, configuration, and testing.
- \$8,700 for Latitude Geographics software and application development.
- \$10,380 for Project Management and Business Analysis.
- \$5,750 for one year of hardware maintenance and technical support.
- \$8,351.85 in contingency funds.

Hardware Acquisition and Installation - \$34,988.48

Manley Solutions, a County vendor, will provide and install in-vehicle GPS and communication hardware, including:

- Acquisition of 20 in-vehicle, fixed mount GPS units with all required accessories
- Guaranteed on-site installation, configuration, and testing of the hardware and accessories.

Software Acquisition - \$15,000

Latitude Geographics will provide two software components for the pilot:

- Wireless Data Server (GPS Harvester) license, software to communicate with GPS enabled devices of all kinds in real time.
- Fleet Tracker for Geocortex IMF license for 50 mobile devices, an extension to the County's existing Geocortex IMF product. This product integrates the information from the Wireless Data Server into web-based mapping applications, providing visualization, rules generation (i.e. notify me in case of airbag deployment) and reporting.

Software Installation, Configuration, and Testing - \$8,700

Install, Test, and Configure Latitude Geographics deploy Fleet Tracker software. Actions will include:

- Install GPS Harvester software.

- Install Fleet Tracker web service and IMF application.
- Test wireless device connectivity and registration with GPS Harvester.
- Test GPS Harvester data connection to spatial database.
- Test Fleet Tracker data connection to spatial database.
- Test application functionality (bread-crumbing, alerts, actions, reporting, printing)

Development Services - \$8,700

Latitude Geographics will develop and configure necessary software and web applications to provide real-time tracking. Actions will include:

- Configure GPS Harvester to “see” installed devices with GPS Harvester.
- Configure Fleet Tracker web service.
- Configure map views for each department/device type.
- Configure Fleet Tracker IMF application, including security, layers, and tools.
- Perform custom development for Fleet Tracker IMF development for required reports, actions and tools as needed.

Project Management/Business Analysis - \$10,380

Project Management actions will include:

- Liaise with County staff regarding project communication, budgeting, resources, and scheduling.
- Conduct needs analysis/requirements gathering for Fleet Tracker application with respect to reporting, security, printing and tool development and configuration.
- Manage application development configuration for Fleet Tracker and GPS Harvester.
- Manage hardware, device configuration and registration, GPS Harvester, Fleet Tracker unit testing.
- Manage system level testing.

Ongoing Technical Support - \$5,750

Latitude Geographics will provide one year of user and administrator technical support for GPS Harvester, device registration and Fleet Tracker application.

Contingency - \$8,351.85

A contingency of 10% of project costs, is included to ensure that any additional hardware, software, and services needed to successfully complete the project can be acquired.

Benefits

The County of Los Angeles will realize the following benefits from its investment in AVL:

- **Fleet management:** when managing a fleet of vehicles, knowing the real-time location of all drivers allows management to meet customer needs more efficiently. Vehicle location information can also be used to verify that legal requirements are being met: for example, that drivers are taking rest breaks and obeying speed limits.
- **Asset tracking:** companies needing to track valuable assets for insurance or other monitoring purposes can now plot the real-time asset location on a map and closely monitor movement and operating status. For example, haulage and logistics companies often operate lorries with detachable load carrying units. In this case, trailers can be tracked independently of the cabs used to drive them. Combining vehicle location with inventory management that can be used to reconcile which item is currently on which vehicle can be used to identify physical location down to the level of individual packages.
- **Field worker management:** companies with a field service or sales workforce can use information from vehicle tracking systems to plan field workers' time, schedule subsequent customer visits and be able to operate these departments efficiently.
- **Passenger Information:** Real-time passenger information systems use predictions based on AVL input to show the expected arrival and departure times of public transport services.
- **Covert surveillance:** vehicle location devices attached covertly by law enforcement or espionage organizations can be used to track journeys made by individuals who are under surveillance
- **Stolen vehicle recovery:** both consumer and commercial vehicles can be outfitted with RF or GPS units to allow police to do tracking and recovery. In the case of LoJack, the police can activate the tracking unit in the vehicle directly and follow tracking signals.
- **Leveraged investment** – This technology leverages existing infrastructure placed in Downey as part of the Enterprise GIS Repository, increasing the returns on this existing investment.

Performance Outcomes

The web mapping application developed during this project will provide ongoing information about the number of devices tracked, number of alerts provided, and maps showing the use and value of the technology. Participating departments will provide feedback on the success of the project, and the uptake of this technology by departments will verify the benefits of the technology. An existing Statistics package from Geocortex will provide counts of the number of times the application has been accessed, further detailing the use of the application.

Project Deliverables

Table 3 below shows a list of deliverables

Table 3: Project Deliverables

Item	Deliverable
1	Acquisition and installation of in-vehicle GPS units
2	Installation of GPS Harvester and Fleet Tracker
3	Completion of web mapping applications to display locations
4	Bi-monthly Status Reports

Funding Requested

The total estimated cost for the project is shown below:

Table 4: Project Funding

Item	Description	Source	Cost
Acquire and install 20 in-vehicle GPS units.	Hardware	Manley Solutions	\$ 34,988.48
Acquire GPS Harvester and Fleet Tracker	Software	Latitude Geographics	\$ 15,000.00
Project Management	Support	Latitude Geographics	\$ 10,380.00
Install, Configure, and Test Software	Development	Latitude Geographics	\$ 8,700.00
Development Services	Development	Latitude Geographics	\$ 8,700.00
Technical Support (1 year)	Support	Latitude Geographics	\$ 5,750.00
Subtotal:			\$ 83,518.48
Contingency	Various	Latitude Geographics	\$ 8,351.85
Total:			\$ 91,870.33

Maintenance

Annual maintenance costs of less than \$10,000 per year for hardware and software maintenance and support will be borne by departments with AVL access. The web application will be hosted at ISD on the Enterprise GIS Infrastructure, which will be supported as part of the enterprise GIS Infrastructure.