A Business Manager’s Guide to GPS Fleet Management Technology

This paper was written as a guide for business owners and managers, to assist in evaluating the technology available for monitoring and managing business fleet operations. It addresses some of the most important reasons to consider a fleet management technology investment, such as:

- Reducing risks for employees and vehicles
- Protecting the business fleet investment
- Saving money through improved operations
- Improving and sustaining overall profitability

Using non-scientific business language together with descriptive diagrams, it guides managers through several aspects of the decision-making process, with special sections dedicated to an explanation of GPS satellite technology; comparing and contrasting available GPS fleet management systems; factors to consider and questions to ask in the integration process; and putting it all together for typical fleet management operations.

The question used to be, "Do I need a fleet management system at all?" Not any more. Now the question is: "Which system is right for my business?" This guide to evaluating what is available on the market today will assist in making that decision. As you will see, the best systems available are designed to pay for themselves through reduced costs and improved operational efficiency.
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Leveraging Technology for Business Fleet Applications

In more ways than we can imagine, information technology has irrevocably altered the way the world does business. It enables rapid global exchange of commerce and ideas, provides tools for efficiency of operation and enhanced productivity. Moreover, it puts business managers in the position to evaluate, measure and assess the effectiveness of their systems in real time and in ways unheard of even ten years ago.

"You can't manage what you cannot (or do not) measure."

An oft-quoted maxim for continuous improvement: "You can't manage what you can not (or do not) measure." Information technology has made it possible to confirm transcontinental shipments via the Internet within seconds; to contact key business partners at any time, anywhere on the planet; and to track inventory and business assets around the clock. The tools for measurement are readily available. The technology is in place. What stands between many businesses and the full optimization of the technology can typically be summarized in one of the following three statements:

1. Education: The business does not recognize or completely understand the value of improving their operations with existing technology.

2. Fear: The business is reluctant to embrace new technology because of uncertainty or concerns about the impact on the existing business model.

3. Reluctance: The business hesitates to make an investment in technology today because the speed of innovation threatens to make that investment obsolete tomorrow.

These responses, while understandable, are counterproductive because they prevent or delay the company’s ability to take advantage of improved productivity, operational effectiveness and profit potential that go hand-in-hand with technology-enabled systems.

For companies that rely upon service, delivery and transport vehicles to accomplish their core business, the promise of fleet management technology begins with measurement and expands to include such areas as safety, assurance and cost savings. This paper is written to provide the reader with some of the basic concepts, capabilities and features of existing fleet management technology.

Fleet management is a blend of activities and functions related to the maintenance, accountability and efficient operation of a company's mobile assets. Whether a company uses technology to streamline this group of tasks, the elements generally include the following:

- Record-keeping and compilation of data relative to the fleet operations
- Accountability of company vehicles and mobile assets
- Maintenance and repair of vehicles and systems, including verification of service intervals

Effective fleet management makes it possible for the company to accomplish these general tasks and improve, as a minimum, each of the following areas:

**Ensuring Employee Safety:** Most companies that rely on drivers and fleet vehicles to get the job done have adopted "zero tolerance" policies against drug and alcohol use and other illegal behavior on company time and in company vehicles. In an effort to stay ahead of regulatory compliance issues, many companies are also carefully evaluating driver safety factors, such as accident records, traffic infractions and speeding.
Speeding is, in fact, breaking the law, but has not been scrutinized as closely as drug and alcohol use. One reason for this is that the ability to audit and enforce compliance with speeding policies did not exist - with GPS fleet management, it is not only easier to assess, but can also be reported instantly and automatically depending on the capabilities of the system.

**Protecting the Fleet Investment:** In a typical small- to mid-sized service business, initial fleet vehicle investment can represent as much as 70 percent of a company's fixed asset base. Maintenance, leases and payments, variable fleet costs, and insurance of the trucks, vans and other vehicles can range from as low as $200 to well over $300 per month, per vehicle; a significant amount of the operating budget that squeezes already-tight margins.

**Sustaining Profitability through Efficient Operations:** Ensuring the longevity and efficiency of the vehicles is a key factor to sustained competitiveness. Equally important to a company's long-term success: consistently superior customer service; containment of overhead costs for improved profitability; and employee commitment and involvement in improving the bottom line.

Effective fleet management systems help business managers to achieve all of these goals. Adding a GPS-tracked system makes this process easier through record-keeping automation, verifiable accuracy and around-the-clock capability.

For years, managers have relied upon driver log sheets, service forms and other paper record keeping systems to keep track of business fleet vehicle operations. To the extent possible, much of this process has been automated, but invariably a fleet manager is required to sort through often-incomplete sheets of paper to reconstruct vehicle records. Technology now exists to improve this process.

A 2002 study published by the National Federation of Independent Business (NIFB) Research Foundation highlights the new considerations for a service-oriented business environment. Safety in the industrial and manufacturing sectors has been under close observation due to government regulation, labor law compliance and employee-rights watchdog groups.

During the last century, these sectors have contracted in North America to such an extent that "traffic accidents - not workplace accidents - are the greatest on-the-job hazard." Congestion and construction on highways and roads, combined with rapid urban sprawl in many areas, creates an increasingly dangerous environment for even the safest drivers on the road. Following are a few of the observations of the NIFB study:

**DRIVING IS PART OF THE JOB:** With the service-based businesses on the rise, workers are increasingly getting their jobs done outside of the defined four walls of a company. More than 60 percent of the survey respondents routinely hire employees who will be required to drive for business-related reasons.

**TRAFFIC ACCIDENTS EMERGING AS TOP CONCERN:** As worker mobility (and related travel) increases the concern of small business owners has also gone up; 38 percent of the NIFB survey participants indicated traffic accidents as their greatest safety concern.

**DRIVING RECORDS A FACTOR IN EMPLOYMENT:** According to the study, 57 percent of small business owners are conducting background checks to evaluate such factors as traffic violations and offenses, convictions for driving under the influence of alcohol or drugs, and trends in driver behavior.
GPS location-based technology relies on a network of 24 active NAVSTAR satellites, orbiting the Earth at an altitude of over 12,000 miles (20,000 km) and constantly transmitting radio signals to ground-based stations and GPS receivers on Earth. What the satellite transmits is its own proximate location to Earth, as well as the precise time of transmission using synchronized atomic clock data.

From this information, the receiver is able to calculate its latitude and longitude based on the signal strength and location of the satellite, accurate to within ten meters. This method, referred to as "triangulation," uses signal information from at least three satellites to determine a location on the ground. The greater the number of satellites within line-of-sight range of the receiver, the greater the accuracy of the location data. Using permutations of the same data, the GPS receiver can also calculate the vehicle's speed and direction.

GPS technology, combined with analysis and mapping software, provides a "bird's eye view" of the fleet vehicle activity, instant locations, and graphic annotation of key events, such as:

- Service stops and customer locations
- Vehicle speeding infractions
- Onboard equipment usage
- Route tracking, including driver stops and variations from route
- "Geo-fencing" verification to ensure vehicles stay within a defined geographical area
- Fleet vehicle location, on demand or at pre-set intervals, for immediate dispatch or periodic update (interval can be set by the manager)

Fleet management systems provide instant access to this data, as well as detailed analysis tools to measure driver efficiency, review vehicle maintenance history, assess fuel usage, and instantly spot anomalies such as driver speeding, unauthorized vehicle usage, and vehicle stops that are inconsistent with business requirements.
Originally designed by the US military for worldwide navigation and precision guidance of weapons systems, GPS satellite technology was adapted for commercial use in 1982. GPS technology is commonly associated with the following applications:

- Automotive navigation and onboard assistance
- Aircraft navigation and flight planning
- Sports and recreation, such as golf, fishing and hiking
- Commercial and consumer automatic vehicle location (AVL) services

GPS technology is a critical component of the emerging telematics industry, combining wireless communications, Internet- and computer-based software and the latest in vehicle-based tracking, location, monitoring and diagnostic capability.

The net result: a fact-based management information system that measures vehicle operational efficiency, driver safety, route effectiveness, and automates vehicle record-keeping, maintenance intervals, mileage logs, service records, and much more. In short, the right system can provide:

- Complete driver accountability
- Reliable fleet operations data
- Automatic reports and data analysis
- Reduced liability and vehicle costs
- Verification of hours and service stops

GPS fleet management systems are designed with one primary goal: to save business managers time and money. Having this technology gives businesses a clear competitive advantage. Access to vehicle efficiency and driver productivity data helps a business manage the costs related to fleet operations, including: engine service and vehicle maintenance, fuel, tires, insurance, customer service issues, employee overtime, workers compensation and liability from accidents.

GPS fleet management systems also provide managers with a way to capture opportunity costs, such as more efficient service or delivery routes, identification of problem areas, verification of sustained customer service, and protecting the company's reputation and substantial vehicle investment.

Following are some of the typical advantages reported by companies with GPS fleet management systems in place:

Reduced overtime - as inefficient routes, unscheduled stops and unauthorized trips are identified, many companies have reported an immediate decrease in reported hours on time sheets, as well as an overall reduction in hours due to productivity improvements.

Reduced fuel costs - vehicles driven at excessive speeds waste fuel. This cost is further compounded by unauthorized and/or after-hours company vehicle use, both of which can be identified and controlled using a fleet management system.

Reduced accident and liability claims - left unchecked, some drivers put the company at risk with behaviors and activities such as making unnecessary cross-town trips that require speeding to the next scheduled job, or driving in a way that exposes a business to higher insurance costs and liability.

Reduced maintenance costs - vehicle abuse adds up over time; an engine left idling all day to keep the air conditioning on takes its toll; speeding leads to wear and tear and premature replacement of tires; and a vehicle that misses scheduled oil changes inevitably breaks down. All of these factors have an impact on a business fleet; with the right system in place, they can be monitored and controlled.
The Business Case:

Top Ten Reasons to Consider GPS for Fleet Management

Automation of many record keeping functions
- Schedule and verify vehicle and equipment service intervals
- Track service locations, equipment drop-off points and routes used
- Electronic records of employee hours and vehicle mileage

Improved Operations
- AVL systems enable real-time decision making
- Real-time accountability of drivers and assets

Decreased Wear & Tear
- Curbs on speeding prevent excessive tire and engine wear
- Verifiable service intervals extend life of vehicles and equipment
- Elimination of unauthorized use reduces overall fleet mileage

Better Use of Company Resources
- Active management of vehicles enables fact-based decisions
- Identify and stop unauthorized vehicle use immediately

Efficient Route Management & Dispatching Support
- Find and control service and delivery route overlaps
- Use real-time driver locations for time-sensitive dispatching
- Evaluate problem traffic areas to prevent service delays

Faster Response Time
- Automation of record keeping improves driver efficiency
- GPS locations assist in guiding lost drivers to service locations

Reduced Liability & Insurance Costs
- Many insurance companies offer a discount with GPS system in place
- Protect against false claims with verifiable vehicle data

Employee Safety
- Keeps drivers focused on safe driving and staying on their routes
- Companies can reward safe driving behavior based on data
- GPS location data enables emergency assistance

Better Customer Service
- No more second-guessing on missed service complaints
- Verify services performed and time spent with each customer
- Provide location and ETA on critical services and shipments

Improved Bottom Line Performance
- Significant decreases in overtime and driver "down time"
- Reduced maintenance costs go right to the bottom line
- Route efficiency and fleet metrics allow for expanding customer base
Vehicle Life Factors

Argonne National Laboratories, part of the US Department of Energy, conducted a study on the aggregate effects of excessive engine idling and speeding as part of overall vehicle operational costs …

ENGINE WEAR-AND-TEAR: Ideal driving speed for the average truck is 50-55mph; the power required to increase speed multiplies dramatically:

- 73% more horsepower to cruise at 60 mph
- 159% more horsepower to cruise at 70 mph

FUEL CONSUMPTION: Each mile per hour above 50 mph increases fuel consumption by one-and-one-half (1½) percent. A truck, which averages 8 mpg at 50 mph, will average 6.8 mpg at 60 mph.

EFFECT ON TIRES: Sustained speeds raise tire temperatures above the critical level, causing strength and wear properties to deteriorate rapidly. Tire wear will almost double at road speeds of 70 mph or greater.

MAINTENANCE COSTS: Gears, bearings, clutches, suspension and drive trains wear much faster at higher speeds. Increasing speed from 50 mph to 60 mph increases maintenance cost by 38%. Increasing the speed to 70 mph increases the cost by 80%.

ENGINE IDLE EFFECTS: Running a vehicle at idle speed dramatically reduces engine life; 60 minutes of idling is equivalent to between 80 and 120 minutes of driving time. The resulting loss of fuel economy from excessive idling can add up to 800 gallons of fuel annually for the average truck.

ACCIDENT AVOIDANCE: Approximate stopping distances, factoring in the reaction time for the average person driving a 2-axle truck, are listed below:

- 50 mph - 275 feet (.92 football fields)
- 60 mph - 375 feet (1.25 football fields)
- 70 mph - 500 feet (1.67 football fields)

At 70 mph, stopping distance is 63% greater than at 50 mph. Even in daylight, higher speeds will significantly increase accident probabilities.
Comparative Systems: Passive, Active or Hybrid?

A key differentiation between "fleet management system" (FMS) and "automatic vehicle location" (AVL) systems on the market today is how they handle vehicle information, how they ultimately communicate back to the home office, and where information is stored in the process.

There are four principal categories of GPS-enabled fleet management systems on the market today. This is a general overview of each type of system, with an observation of the potential "pros" and "cons" associated with each:

"Passive" (or Stored Data) System

An on-board device records GPS signal data during the vehicle operations. Information is stored for retrieval and upload to the principal fleet management computer when the vehicle returns to home base.

Alternatively, removable memory modules can be exchanged in the field, away from the office, by mail or during scheduled meetings. The "passive" GPS system is often the best solution for data collection on vehicles that are on the road away from the home office for weeks or months at a time.

PROS:

- Provides a workable solution for fleets and company vehicles that do not return to a motor pool or home office every day.
- Gives specialized staff, such as sales representatives, the ability to distinguish between personal and company business vehicle use.
- This is frequently the most economical choice, managed "hands on" by the company that purchases the system and requiring no communication service contracts.

CONS:

- May require the use of a data module or other removable/exchangeable device in order to retrieve vehicle information.
- Does not allow for real-time location or remote accountability.
"Active" (or Real-Time) System

Again, relying on a vehicle-mounted GPS receiver, the "active" system also requires a wireless communication conduit such as a cellular data line built into the device. At a set time interval, the system transmits location data, (latitude and longitude) speed and direction of travel over the wireless network to a dedicated data collection point. This data can be transmitted directly to the fleet home office or compiled for transfer to an Internet site where the subscribing company can view its fleet activity.

PROS:

- Provides vehicle locations back to the home office at a set interval, allowing the fleet manager to keep track of vehicle activity without calling the drivers.
- Facilitates "on the fly" adjustments to routes to accommodate special situations, by locating the vehicle in the best position to make a service call or complete a requirement.

CONS:

- This type of system may actually require additional manpower to observe fleet status updates throughout the day.
- Depending on the interval of data transmission, monthly access costs can add up quickly. It is important to know how often updates will be required.
- Data stored on the internet is available for a limited time only, making it difficult to perform trend analysis over long periods of time.
The "hybrid" system combines the functionality of passive and active systems into a package that gives companies the immediacy of real-time vehicle data as well as the comprehensive information storage of a stored data system. By combining the best features of each system, the hybrid GPS fleet management system is an ideal tool for giving managers real-time vehicle locations and status updates, as well as the data logging that would be too costly and cumbersome over Internet-based services.

**PROS:**

- Companies have access to comprehensive vehicle data as they need it, in real-time transmissions and in stored data.
- Even in the event of interrupted communication, vehicle data is stored in the on-board device for evaluation and long-term storage.
- Hybrid systems provide the most flexibility and adaptability to most business needs.

**CONS:**

- Using the communication features of a hybrid system requires an active Internet connection or other conduit, and may require a dedicated computer.
- Service contracts, connectivity and transmission charges apply when using the active part of the system.
Using a dedicated constellation of Low-Earth-Orbit (LEO) satellites, this two-way mobile satellite tracking system allows for instant digital communications between drivers and their respective operational bases.

Typically used by over-the-road trucking companies, this is the most expensive approach to GPS fleet management. It is also the most comprehensive in terms of connectivity and range - LEO-based systems provide service where conventional communications are not feasible, such as in marine shipping, remote areas of the world, and rural areas where cellular service is not established.

PROS:

- System allows true global real-time two-way communication with highest accuracy of all available systems.

CONS:

- Generally this is the most expensive system on the market; infrastructure and monthly service costs are prohibitive for most small- to mid-sized companies.
Putting it all Together:

Equipping a Business for GPS

The good news is that the most expensive components of the technology, the 24 GPS satellites, are already in place and paid for. Here are some of the common items and accessories needed for integrating GPS fleet management into business operations.

**For the business fleet:** Vehicles will require an onboard GPS receiver, typically installed inside the vehicle with a GPS antenna mounted to receive satellite signal data.

Depending on the specific monitoring needs, additional sensors can be installed on doors, access points, and special equipment. These sensors are typically linked to the vehicle unit using input/output ports, similar to peripheral devices on a computer.

The onboard vehicle unit is responsible for receiving GPS satellite information, interpreting the data to determine a location, using changes in location to compute speed and direction, communicating with the base station (home office) and logging vehicle movement data.

**For the office:** The "active" and "hybrid" fleet management systems generally require Internet connectivity and possibly a base station antenna for receiving incoming data.

"Passive" fleet management systems require an office-based device that accepts the vehicle data and transfers information to a computer for analysis.

**For the Information Technology (IT) department:** It is recommended to have one computer dedicated to fleet management operations. Typically, the computer will have the MS Windows operating system, at least 128 MB of RAM to support the data management requirements, and a specific software application designed for the supported fleet management system. Some systems allow integration of the fleet data into an existing enterprise resource program (ERP) or other selected databases.

**Fleet management software:** The linchpin for modern fleet management systems is the software that enables interpretation and analysis of comprehensive and historic vehicle data.

While not all fleet management software packages offer identical features and functionality, here are some of the common modules and components on the market:

System Interface: Support software for fleet management systems is typically designed to have the look and feel of standard business applications, including the drop-down menus and graphical user interface (GUI) functionality found in most Microsoft Office® or comparable products. On the best systems, the data management portion of the software works directly with the mapping software to provide seamless reporting and facilitate ease of use. Reports and comparative data can be viewed on screen or printed, and many programs offer the ability to "drill down" for a more detailed assessment of vehicle data.
Business Record Keeping: Data-driven fleet management systems, ones that feature download capability and transfer of a broad spectrum of vehicle operational information, also help to simplify record-keeping, verification of employee hours, customer service and other aspects of the business where vehicle use becomes an issue.

Daily logs can be completely automated, making historical review of driving trends, route efficiency and time spent with customers an intuitive process. Many fleet management systems are able to provide graphical displays of key data sets, such as miles driven, engine idling, on-board systems use; and isolate exceptions for careful evaluation, including instances of speeding, driving after authorized hours, or use of equipment outside the scope of the business.

Interface with existing Enterprise Resource Program (ERP): Existing database-driven management systems, such as Oracle® or SAP®, make it possible for managers to make decisions based on facts and real-time business information. A fully optimized GPS fleet management system can offer the same capability. Integrating fleet operations, vehicle route data and historical analyses into the existing ERP streamlines the decision-making process and facilitates more efficient operations.
Checklist:

Selecting a GPS Fleet Management System

Choosing the "right" system depends on the business and its typical day-to-day fleet operations; the scope, size and structure of the enterprise; and the level of vehicle detail required.

Information currently used in dispatching vehicles or assigning driver routes serves as a viable baseline for putting a GPS fleet management system in place. It is important to balance the "need to know" against the "nice to know" information when choosing the appropriate system. Having too much data is not always a good thing - filtering out extraneous information allows the business to focus on the key metrics of success for fleet operations. For most companies, current and accurate data is the most critical aspect of fleet management.

In assessing the business case for a fleet management technology solution, there are six critical areas to evaluate:

Value-Added Functionality

Proliferation of GPS systems in the marketplace for every imaginable application requires a sense of due diligence in determining the best solution for the specific needs of the company. A company considering fleet management technology systems should first have a clear vision of what it needs to control its existing operations, then look at the potential solutions for enhancing the business.

For example, a company that maintains a fleet of vehicles for its geographically-dispersed sales force is not likely to need minute-by-minute updates on vehicle location, but may need to verify mileage and other information for lease, tax or maintenance purposes.

Seamless System Integration

In many cases, a GPS fleet management system will require installation of vehicle devices and special software to translate the fleet operations data into a format usable by the business. This may include mapping software, a vehicle database, and graphics to depict trends and cumulative information. There are typically minimum system requirements, including the computer's operating system (UNIX, MS Windows, etc.) and random-access memory (RAM) capability for running the software.

Some systems on the market will require a stand-alone computer dedicated for fleet operations, and depending upon the type of system selected, may require additional communication infrastructure, such as dedicated telephone lines, antennae for signal reception, Internet connectivity and ancillary hardware to support the fleet management technology.

Cost-Benefit Analysis

Some providers of GPS systems do little more than ship off-the-shelf tracking devices and software to businesses in a "one size fits all" approach. For a small business with very few vehicles, this may be an acceptable solution.
The best fleet management solutions providers on the market take a consultative approach to equipping their customers with the most appropriate fleet management technology system that suits the business needs.

Simplicity of Use

Ideally, a GPS fleet management system will blend almost transparently into the business operation. It should not require significant driver interaction to operate, and in many cases the best solution is one that is truly "out of sight, out of mind."

Stability of Service Provider

Depending upon the type of system purchased, ensuring the viability of the servicing company may be a critical factor in the sustained value of the system. Particularly with ACTIVE and HYBRID fleet management systems, if the service provider goes out of business, this could render the fleet management system obsolete. Determine whether the fleet management system could be transferred to another service provider, or if it can operate as a "stand alone" system using commonly available cellular channel capability.

Service and Future Compatibility

An important part of the selection process is an evaluation of the contingencies associated with acquiring technology systems:

Who is going to help if something goes wrong?

Each company has its own approach to service. Off-the-shelf systems shipped to customers for self-installation often come with no dedicated support. It is important to find out what types of assistance and warranties are available to protect the investment and get the most out of the system.

To avoid misunderstandings, it is important to spell out exactly what is included in the sale (such as installation, software consultation, service calls, etc.) prior to signing a contract.

What happens if the technology changes making the system obsolete?

Here, it is important to determine if upgrades to the system and/or software are made available to customers, and at what charge? Are map updates provided, and if so at what interval and at what cost?

What will it cost to change the terms of service?

As business needs change, it may be necessary to adapt the system to handle different priorities. Identify available options for each system up front, and realistically assess what features are needed now to improve business operations. Then look at the future goals of the business to determine possible value-added features that will assist in achieving those objectives.
FAQs:

Following are some of the questions to ask in the process of equipping a business fleet:

Employee (Driver) Considerations:

What (if any) training is required in order for the drivers to use the system?

Are there any legal or employment considerations involved in using a fleet management system? (Based on locality)

Installation Considerations:

Where will the GPS receiver be installed on my vehicles?

Will the driver be able to access or tamper with the on-board devices? Will they need to touch the system at all?

Will the device interfere with operation of the vehicle?

Communication and Coverage Considerations:

Can the system use existing cellular service (i.e. cellular phones issued to employees)?

Will drivers be able to communicate using voice and/or text with this system?

How will data be transmitted to and from the vehicle?

What are the different methods of transmitting data, and what is the most cost-effective option for my business needs?

CDMA - Code-Division Multiple Access, a special method of coding message traffic for interpretation at the receiving end

CDPD - Cellular Digital Packet Data, uses packet overlay transmission for efficient data transfer

GPRS - General Packet Radio System, uses efficient network access to only send data as it becomes available, primarily using GSM architecture.

GSM - Global System for Mobile Communications, GSM is the standard for cellular data transmission in Europe, and is used in over 160 countries worldwide.

Satellite-The most expensive method of communicating, it is also the fastest. Typically, this option is reserved for over-the-road trucking companies and conglomerates with global fleets.

TDMA - Time-Division Multiple Access (some times referred to as D-AMPS) enables digital transmission of radio signals to interface between cellular and radio systems. The ability to use multiple channels to carry both data and voice makes this an ideal standard for virtual private networks (VPN) and other common business applications.
What range of coverage will I have for tracking vehicle operations?

Data Accuracy:

How can I be certain that the location and vehicle activity data is accurate?

What is the margin of error for vehicle locations?

How long will vehicle data be accessible?  What is the storage capacity?

Mapping Coverage:

Does this fleet management system include mapping software?

Does the mapping cover the areas where my fleet operates?

How frequently is the software updated to include new developments, business locations and other geographical considerations?

Are upgrades available if my business expands to other regions?  Other countries?

Conclusion:

What’s the Next Step?

Learning about the technology and applications available for fleet management is an important first step. Armed with the basics of GPS technology and common system capabilities, it is now a question of selecting the right system to fit the business needs.

Consider what is important to the business today, and what it will take to stay competitive in the future. Carefully weigh the importance of each of the benefits a fleet management system brings to the equation, including reduced risk, improved employee safety, more efficient operations, reduced costs and overall enhanced profitability.

Some of the companies offering GPS fleet management systems for commercial fleet purchase take a consultative approach to equipping their clients’ vehicles based on that business’ particular needs. Working with someone who knows the technology and the business applications increases the likelihood of a successful implementation. The consultant can typically provide a cost-benefit analysis to show conservative and best-case scenarios, and in many cases can offer a limited trial or case study to show what GPS fleet management technology is capable of.

Evaluating and implementing new technology does not have to be stressful or prohibitively expensive. First, find out what the business needs are, taking into consideration how the ability to measure, monitor, locate and track company vehicles could enhance the way the company operates. Then evaluate the systems that come closest to meeting current and future business needs. The biggest factor in a successful system purchase is identifying what the company will need to achieve its goals. Thank you for taking time to learn about GPS fleet management systems and applications.
Glossary:

Common GPS Technology and Fleet Management Terms

Automatic Crash Notification (ACN) - vehicle onboard system designed to notify a designated call center in the event of a significant collision, reporting the vehicle location, speed and severity of the crash, deployment of airbag(s) and other diagnostic information from onboard sensors (sometimes referred to as "Mayday Systems")

Automatic Vehicle Location (AVL) - the automated system and related technology of tracking vehicle locations. AVL systems utilize GPS technology coupled with wireless communication systems to provide a vast array of data to the home station and/or fleet operator.

Data Packet - Information about a vehicle or group of vehicles, or other non-voice data, transmitted via communication conduits (cellular, Internet, etc.) to the fleet management system computer.

Differential GPS - using data from at least four (4) GPS satellites, this method of GPS corrects for a naturally occurring error to achieve a more precise location, usually within 2 meters.

Enhanced 911 (E-911) - based on a Federal Communications Commission (FCC) mandate, all cellular phones built after October 1, 2001 must be equipped to identify the caller's location at the 911 Call Center.

Galileo - essentially the European version of GPS, this system is currently under development. It will ultimately consist of 21 to 28 satellites in a mid-Earth orbit (MEO) and between 3 and 8 satellites in geosynchronous (GEO) orbit, which may use signals from GPS.

General Packet Radio System (GPRS) - packet switching technology where information is transmitted in short bursts of data over an IP-based network allows continuous connection to data networks in support of many kinds of applications, including messaging and rapid data transfer.

Geocoding - Using latitude and longitude data from the GPS receiver to determine the map location, and (with software) find the exact street address or block address.

Geographic Information Systems (GIS) - a combination of the geospatial data systems and software designed to support transportation routing and logistics, generally for a municipality or regional area.

Global Orbiting Navigation Satellite System (GLONASS) - a Russian space-based navigation system comparable to the American GPS system, GLONASS is comprised of 21 satellites in 3 orbital planes, with 3 on-orbit spares.

Global Positioning System (GPS) - A technology that uses signals and data from multiple satellites to determine a location anywhere on Earth.

Global System for Mobile Communications (GSM) - originally short for 'Groupe Spécial Mobile' GSM is the digital wireless communication standard for Europe, as well as South Africa, Australia, and many Middle and Far East countries.

Intelligent Transportation Systems (ITS) - A general term for many technology systems used in highway, rail and other transit to improve mobility, reduce accidents, and improve transportation overall, i.e. electronic toll collection systems, synchronized traffic signals.

NAVSTAR - The Navstar Global Positioning System (GPS) is a space-based constellation of orbiting satellites providing navigation data to military and civilian users all over the world.

"Ping" - A vehicle status update request, available only with fleet management systems offering active/real-time vehicle location capability.

Selective Availability - prior to May 2000, the US military intentionally degraded the accuracy of GPS signal data for civil and commercial purposes as a protective measure. The Department of Defense retains the right to restrict signal accuracy in the interest of US national defense.

Telematics - a general term referring to emerging technologies in automotive communications, combining wireless voice and data capability for management information and safety applications.
We hope this paper has helped you understand the technology and the benefits of GPS fleet management systems. If we can be of further assistance or to request additional information, please contact us:
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