

# Using Reports to Prove Return on Investment

## Combine Reports for a Complete Picture of Your Fleet Performance

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## Fleet Management Reporting : Measurement to Prove ROI

Automatic Vehicle Location (AVL) is a proven technology to aid fleet management reach better efficiencies. Hundreds of thousands of vehicles today are being tracked by GPS with the data being collected to tell fleet managers exactly where their mobile assets are, how long they stay there, whether or not they are being driven aggressively, if they have left designated routes, where and how much chemical or sand is being distributed through spreader controllers, and more. Private businesses and government entities alike have discovered that fleet management through AVL technology allows them to mitigate risk and lower insurance costs.

What is surprising, however, is how rare actual, definitive measurement is being accessed from the flood of AVL data being compiled every minute into the program's server.

The measurement available through standardized AVL reports can prove Return on Investment in a host of ways. By using a set of standard reports, along with customizable reports set up for specific needs, fleet managers can justify their organizations' costs for tracking as well as help increase value in large enterprise investments such as GIS data sets; for instance, Esri ArcGIS®, or in Work Order Management programs; for instance Cityworks®.

No one has the budget freedom now to install new technology unless they can prove its value to the bottom line. Fortunately, proven ROI and the ability to bring other platforms into higher efficiencies is inherent in the right AVL program.

Fuel and labor costs continue to rise, as does the cost of vehicles and other equipment necessary to serve your customers. Whether you're a utility with vector vehicles; a public works department with everything from backhoes to snow plows; an oil and gas company with distributed and mobile assets; a state Department of Transportation – your budgets are getting tighter and tighter as prices rise. Making everything run more productively is imperative, and AVL can help you do that – and can help you prove that you're doing that.

## Why Use Reports?

Here is an example of how using a standardized "Stop/Idle" report for regular measurement can help a fleet manager save money and aid in proving AVL Return on Investment:

A County Roads Department in a northern state uses 70 snowplows (counting county-owned and contracted vehicles; the contracted vehicles are given portable GPS hardware at the beginning of the season which are tied into the AVL program)

Average active monthly hours per snowplow (during the eight-month snow season of Oct – April):  
80 hours per truck

Average idle time per truck per active month: 30 hours per truck (not unusual)

70 snowplow trucks x 30 hours = 2,100 hours per month of idle time for fleet

\$3.90 per gallon of diesel fuel;\* assuming conservatively one hour of idle time consumes one gallon of diesel fuel:

Total monthly idle time fuel cost:  $2,100 \times 3.9 = \$8,190$  per month

\$18 per hour personnel cost.

Total monthly idle time personnel cost:  $2,100 \times 18 = \$37,800$  per month

Fuel cost savings with just a 15 percent reduction in idle time per month: \$1,228.50

Personnel cost savings with just a 15 percent reduction in idle time per month: \$5,670\*\*

Over the course of the eight-month snow season, total savings per snowplow fleet with a 15 percent reduction in idle time:  $(5,670 + 1,228.50) \times 8 = \$55,188$ .

*\*national average diesel fuel cost as of Dec. 1, 2011: \$3.974, according to <http://www.truckmiles.com/FuelPrices.asp>*

*\*\*NOTE: with less idle time, the personnel cost may be not eliminated but put to better use; which could also be measured in productivity gains*

*Steps:*

1. Determine the baseline. Use the AVL reports to first measure the amount of idle time per vehicle and average per your fleet
2. Working with your department, determine what amount of idle time might be appropriate: for instance, snowplow vehicles require warm up time.
3. Train your drivers: point out to them that a 15 percent reduction in warm up time gets them on the roads sooner and saves the department in fuel costs.
4. Measure the actual idle time going forward, to verify the training worked and to place the measurement against fuel and personnel time expenses.

## CompassReports: Designed for Accuracy

As a fleet is tracked through AVL, hundreds of thousands of bytes of data flow into a server every hour, where the software compiles the information into a SQL or Oracle database.

Without standardized reports, querying that database for information can be a time-consuming exercise. This can limit the ability for managers to run regular, timely reports or to pull them often enough to make useful comparisons and ROI determinations. For example, comparing fleet mileage numbers from week to week with a fast, standard report can provide managers with numbers that they can use to design better routes, monitor fleet vehicle usage, and control costs. But if those reports are difficult or time-consuming to run (because the database contains millions of lines of data) many busy managers will not bother.


CompassReports allows for a higher level of fleet management through real time and fast past-performance reporting of your mobile workforce, because it works with the CompassCom system that is already designed to compile and sort information into pre-determined standard categories. As information about speed, location, turns, stops, and activities streams in to the CompassLDE (Location Data Engine), the system automatically routes data such that standardized reports can be made of the historical data in just seconds, upon receiving a query.

## Standard Reports

Standard reports help to create a complete fleet management picture

### CompassCom Standard Reports

The below table shows the report icons, report name, and a brief description of how to use a standard report in CompassReports:

Reports	Reports Purpose	Reports	Reports Purpose
	<b>Speeding</b> Discover unsafe driving behavior and monitor fuel usage (speeding takes more gas). Speeding may also require more vehicle maintenance due to wear & tear. This report will flag user defined speeding events: when a mobile asset travels above a certain designated speed for more than a defined period of time.		<b>Mileage</b> Know the mileage of every vehicle in the fleet. Monitor use, estimate the amount of CO2 emissions, plan maintenance for maximum efficiency and fewer unplanned expenses. Run special mileage reports (i.e. miles with Plow Down)
	<b>Stop/Idle</b> Save money on fuel, improve driver behavior and meet emissions compliance regulations. Determine when a mobile asset has stopped for a period of time. This report can determine when the mobile asset is stopped AND the engine is running (e.g. idling).		<b>Inputs</b> Used to determine Input Events such as Lights on/off, Plow up/down, or any other inputs that may be wired on the mobile asset. Cut out "Dead Heading" and improve productivity and efficiency. Know the mileage and duration of an event.
	<b>GeoFence</b> Know when fleet trucks enter a designated area or site, how long they stay there, and when they leave. Know when service trucks arrive at an address. Know when an asset is not where it is supposed to be (prevent theft and/or misuse of equipment).		<b>Snow/Material</b> Control your materials expenses. Know exactly how much material is used and how much it costs: track type of material (liquid or granular) and the total amounts spread per vehicle and by the fleet. For this report to run, the mobile asset (snow plow) must provide digital spreader control telemetry.
	<b>Turn</b> Used to determine the number of left vs right turns. Routes with more left turns require more time, more fuel and are less safe than routes with more right turns.		<b>Activity</b> Know which mobile assets have had activity in a given time period and which have not. Determine quickly if a mobile device is working correctly. This report provides the "last known" state of a mobile asset given a date range.

Standard reports also include optional upgrades, including Automatic Alerting and Customized Reports.

*Return on Investment for your specific fleet uses can be determined through running reports in these categories:*



Speeding

According to research by the National Highway Traffic Safety Association (NHTSA), which encouraged cutting down on speeds to save lives and costly injuries, lowering speeds also reduces maintenance and vehicle repair expenses, saves money on insurance claims and cuts vehicle down-time caused by accident repair. The research showed that the severity of an accident doubles for every 10 mph over 50 mph; and incidentally, passenger cars and light trucks use approximately 50 percent more fuel when traveling at 75 vs 55 mph.



Mileage

For fleets with vehicles that regularly cross United States and international (Canada and Mexico) border lines, the International Fuel Tax Agreement (IFTA) regulations require quarterly reports of mileage documentation and fuel purchases per State per vehicle – adding up to considerable administrative costs in order to comply. This regulation is meant to help reconcile government expenses in road maintenance, between fuel taxes paid and roads actually travelled. Automatically compiling such data through an AVL and On Board Diagnostic (OBD) program not only aids fleet management in driver training and vehicle maintenance cost savings, it can add up to thousands of dollars per year in administrative time saved.



Stop/Idle

According to the American Trucking Association, one hour of idling per day for one year results in the equivalent of 64,000 miles in engine wear. Besides extending vehicle life and saving on fuel costs by eliminating idling, the ability to measurably lower emissions through AVL monitoring can provide easy-to-produce audit documentation for compliance with EPA regulations. An average-sized vehicle (sedan or mini-van) can consume one to one and half gallons of fuel in a single hour of idling.



Inputs

Measure the exact length of time per event: work order fulfillment, delivery, route to job, etc.

This can serve as a benchmark for personnel training – how long does it take to perform tasks in the field to an exact degree; with follow up measurement to see how training has made a difference in worker efficiency. Inputs can also be tied to third-party work order management applications to ensure maximum efficiency.



GeoFence

ROI on Geofencing is two-fold: geofencing provides lower insurance rates due to better control of field assets; and provides more accountability in asset use. Geofencing can pay for itself through the elimination of theft or unauthorized removal of vehicles for private use during off-times. State lines or municipal borders can be established as a geofence with time stamps for crossing or alerts if required, which can aid in compliance or contract issues. Substation geo-fences can be set up a number of ways with movement notification from yard, project or emergency. A geofence can also act as a “time-card” for the time a vehicle or trailer spends in a specific area; monitoring departure for projects and arrival afterward. A geofence alert tied to a dangerous neighborhood alerts the team when a vehicle has entered that area so safety monitoring can be heightened while personnel are there. Information from a geofenced area can be filtered by vehicle, group, or fleet-wide, and historical replays to verify geofence compliance are easy to perform.



Snow/Materials

Measure the amount of chemicals, sand, herbicide, insecticide or other materials used, using the spreader controller connection that CompassCom provides. Use the Materials report to benchmark the amount of material distributed per vehicle per route, and following each distribution measure effectiveness. Plan routes and distribution to cut materials by five percent increments, and learn through this what the true correct amount per route should be. Also, verify that the materials distributed are being used to maximum efficiency by being spread only on the route designated.



Turns

When routes contain many left turns, they require more time, more fuel, and risk more accidents.

The Turn Report can help managers plan their routes to maximize the right turn ratio and ensure your vehicles are more efficient and safer on the road.

### *Customized Reporting Options*

Besides the standard reports that are compiled by CompassReports, clients can create reports to meet specific needs. Some reports CompassCom has created in the past for clients include:

- User Defined Calculations
- User Defined Groups
- Personalized Reports
- Single Reporting from LDEs
- What-If Module for Forecasting
- GeoFence Reports
- Supply-Chain Logistics

## How They Work Together

Using CompassReports, consider the trends within your fleet – where is the budget going:

- Are your fuel costs in alignment with the reported mileage and routing?
- Is there an indication that drivers are pushing the vehicles, increasing wear and tear (aggressive driving such as speeding, mileage beyond what is expected, excessive idling etc.)

## Planning Continual Improvements Through Data - Driven Knowledge

Planning that uses past seasons' AVL data can provide measureable Return on Investment for the entire program.

With every season, managers can tweak the program and measure results to make sure they are meeting required goals, in the most efficient way. For instance, using CompassCom's integrated solution with spreader controllers, managers can test their program by using progressively smaller amounts of chemicals such as pesticides or sand each new season.

Consider the severity of different storm events and what that requires in de-icer and sand. If a magnitude three storm event normally has the snowplow fleet using a previously specified amount of sand, test the efficacy by decreasing the amount by 3 percent at the next magnitude three storm. If that decreased amount still does the job, then you've saved money for the next storm. Continue to measure, monitor and whittle down the amount of chemicals and sand needed until the exact amount per category of storm is determined scientifically – using your AVL reports to prove it.

## More Ways to Use Reports

Besides measuring fleet performance in order to manage the vehicles, drivers and related equipment better, using CompassReports provides a huge benefit in providing administrative support.

### Administrative Cost Benefits

To go back to the snowplow example: Consider a not uncommon situation for a northern State: say it has identified 850 routes where state interstates and highways must be kept clear of snow and ice during any storm event. The state Department of Transportation conservatively estimates that it costs approximately one million dollars for each day they fight a winter storm event, so they budget 30 million dollars annually and hope that the year is not one of extreme weather.

Materials cost for salt and de-icing chemicals such as mag-chloride is a gigantic budget item that is affected by inflation and demand. State compliance with budget rules requires documentation of how much is used in every storm event of the season. A standard estimation is that it requires two hours to document materials usage for each route, (without a standard AVL report function). So administrative costs add up:

Per storm per route: 2 hours of administrative work

Number of routes: 850

Number of storm events annually: 30

Cost per hour to administer route material usage documentation: \$25

*Total: 2 hours x 850 routes x \$25 cost = \$42,500 per storm event or \$1,275,000 annually – just for the administration costs, alone!*

Using CompassReports, however, can provide the data necessary to meet the compliance requirements in minutes, rather than hours – and the data can be shared so that fleet managers can run their standard reports to provide them with the data they need to continually improve fleet performance, and share those reports with administrative back offices that are tasked with the compliance audits.

## *Productivity Management*

Monitor for calculations of actual productivity and cost per project. AVL can bring this measurement into clear focus with automatic checks on when an individual or crew began a shift, exactly where they and their equipment travelled, by what routes, using what materials, and when they finished.

A recent Aberdeen Group study found that a fleet management program reduced overtime costs by an average of \$496,493 in firms with more than 100 vehicles deployed.

There has been some concern expressed about AVL for productivity management, that it is “big brother” in the field. This seems a disingenuous argument. When one takes a job, one expects to be monitored while on the clock. Whether in the office or in the field, managers have a right to know where their employees are and what they are doing. In another aspect of the same issue, if a worker in the field is in an accident, and help cannot arrive in a timely manner because there is no alert to the office and no GPS capability to find them, there’s a likelihood the employer could be sued for not installing the modern technology necessary to have provided that safety component.

## *Lowering Legal and Damage Claims*

Consider the annual budget cost already factored in to your agency for settling claims and complaints against winter maintenance programs. Claims can be fairly small, such as for windshield or mailbox replacement – to catastrophic, from accidents or even fatalities caused by accidents. Minus an AVL program, public works departments can find themselves in court battles dominated by hearsay. With fleet management, there’s no doubt: mistaken claims can be dismissed quickly and actual fault can be discerned and settled appropriately, saving time, money and headache. It should be easy to see whether one of your fleet vehicles was on the road where the windshield claim was made, or even better, when your website includes a public-facing portal showing where your vehicles are so there’s no mistake (“It looked like a county truck to me”) Win legal cases – or keep them from ever going to court – by producing detailed records showing exactly what road treatments were performed, where and to the minute.

It is possible to measure ROI year to year in the matter of saved legal expenses. Consider the annual budget for the past three years (and the actual cost) for claims filed. If possible, determine if any of those claims could have been dismissed or court expenses could have been lessened if an audit showing exactly what the fleet vehicles in question had been doing had been available. But even if that information is not available, a comparison of such expenses after a year of AVL, and after three years, will likely show significant savings.

## *Leverage Other Enterprise Investments*

A larger enterprise, such as a government agency, utility company or an oil and gas company, may well have purchased Esri ArcGIS® – an expensive investment that is not fully leveraged if AVL has not been implemented. But managers may have postponed thinking about AVL just because the challenges of coordinating all those disparate contracts and elements is too much of a project to take on. However, if you create a Common Operational Picture with your dispatch center, cost savings in your field operations can also be combined with more efficiency in use of this existing expense.

Work Order Management solutions, such as Cityworks, Accela, PubWorks or Maximo can also be tied to your AVL, allowing even more efficiency in the field.

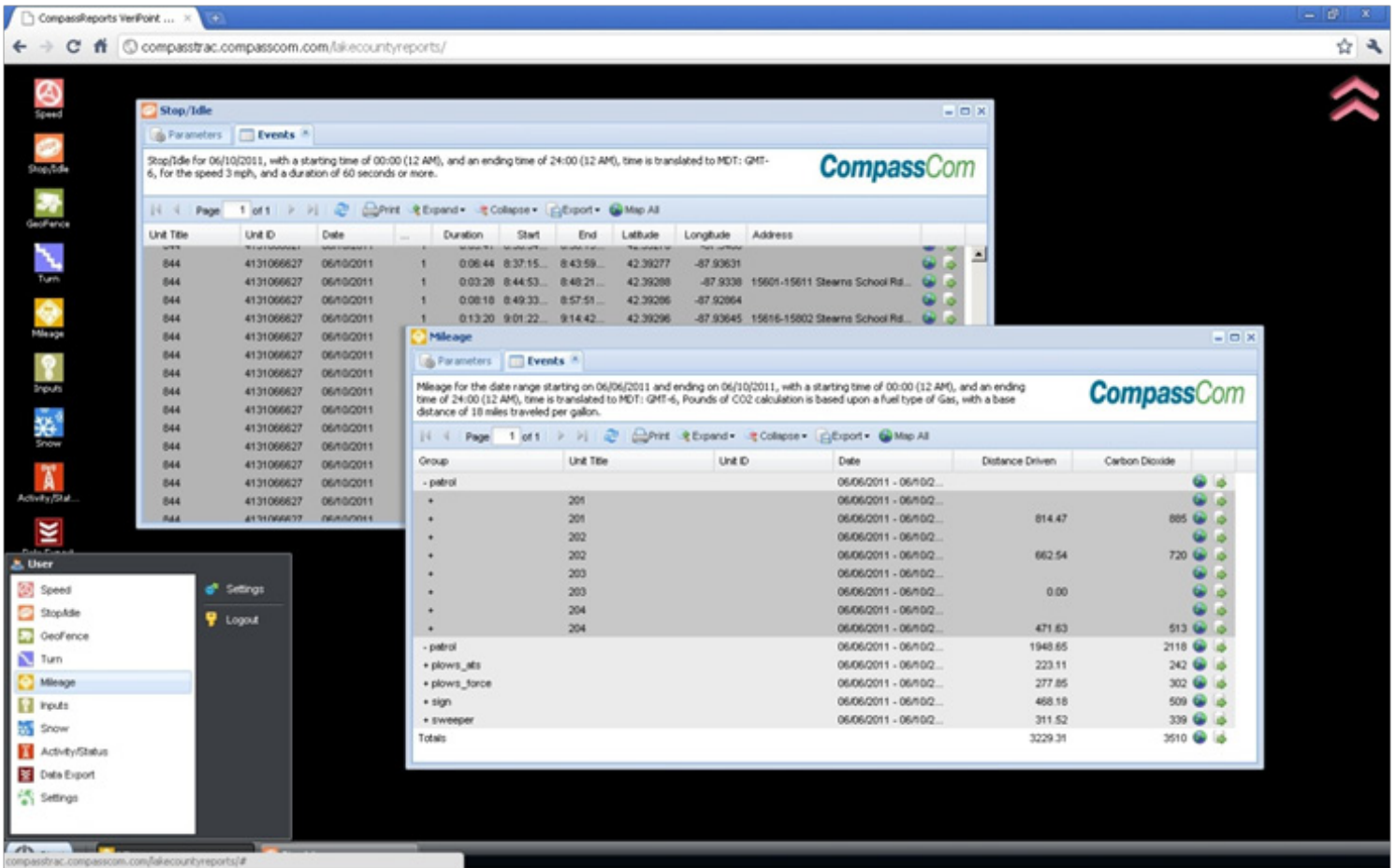
Bringing Reports into the shared picture can help prove ROI across the board for all these applications. In conjunction with the efficiencies of a Work Order Management solution, showing through “Inputs” that jobs are being completed faster and with less confusion and paperwork can verify to oversight boards that the investments were worthwhile in the first place.

## The CompassCom Solution: CompassReports

CompassReports ensures you don't have to wait for reports – information based on your needs is compiled quietly in the background so that as soon as you need it, a report is ready to go.

CompassReports exports easily into standard formats (html, CV, Microsoft Excel) for interoperability with other management software.

Run reports concurrently for side-to-side measurement of vehicle statistics, groups of vehicles or the whole fleet. Run flexible replays: designate the times and duration for a replay report.



CompassReports is an add-on module for CompassTrac and CompassTrac Mobile.

CompassCom offers a complete suite of integrated solutions to meet your AVL needs.

For more information, contact CompassCom at 800-787-0651.