



Sensor Sensibility – Building the Business Case for
Incorporating External Sensors as Part of Your
Automatic Vehicle Location Solution





Executive Summary

Fleet managers seeking to maximize productivity, improve asset utilization and verify work processes are now frequently turning to automatic vehicle location (AVL) technologies to improve operational performance. AVL allows fleet managers and dispatchers to track asset movement and pinpoint location information in real-time, and combined with GPS, this information can be mapped offering fleet operators a big picture view of a fleet and its activities.

The value of such an AVL solution is inarguable. However, fleet managers can extract even greater value, and draw even more granular information from an AVL solution with the simple, and cost-effective addition of sensors.

The challenge lies in convincing senior management to go that extra mile. In this whitepaper, by BSM Wireless, a leading provider of fleet management and fleet diagnostic solutions, we'll look more closely at sensor technology to better understand how it works, the effort and costs required to add sensors to an AVL solution, and the value and additional efficiencies sensors can bring to a fleet operator.

The Challenge

When organizations invest in an AVL solution, it is most often driven by a real business need to monitor the organization's very expensive vehicle assets while on the road, and to monitor the company's driver workforce. AVL technologies allow a fleet operator to measure, tune and improve process; make the best use of every asset in the fleet; monitor and manage labor productivity; and ultimately reduce costs where possible.

Other benefits of AVL technology include: better schedule and route adherence; better customer information; and better information for short term decision making and long term business planning.

Why Consider Adding Sensors to Your AVL Solution?

The addition of sensors as a part of a broader AVL solution provides distinct and measurable value to any organization. They answer an important question that is not currently addressed by most AVL solutions installed within fleets today. And that question is: how can you verify that work is actually taking place?

With fleet operators seeking to eke out every gram of efficiency from vehicles and drivers and manage compliance to increasingly stringent state and provincial regulations governing hours of service (HOS), emission control, the verification of work performed becomes increasingly important. External sensors coupled with AVL technology perform exactly that function.

In the rest of this paper, we'll explore some of the many reasons to consider adding external sensors to your AVL solution, looking at a number of sensor application scenarios, and document the many the benefits that result from the use of sensors.

Verify Power Take-Off Engagement (PTO)

Monitoring and measuring PTO can result in significant fuel tax savings for companies located in state and provincial jurisdictions where PTO rebates are provided. This rebate can be as high as 24 cents on a gallon of fuel, which can translate to literally millions of dollars in cost savings for a company with thousands of fleet assets.

A PTO sensor used on vehicles responsible for delivering of bulk materials, such as an oil delivery truck can aid dispatch in verifying that the vehicle arrived at its intended destination (through AVL GPS), and through the use of external sensors on the vehicle and devices i.e. lifts, pumps, and meters, verify that work did indeed take place at the location by recording PTO engagement and providing an appropriate delivery was made.

Verify Adherence to a Defined Work Process

In specific industries, such as armored car delivery, there are stringent work processes that govern the behavior of a vehicle and its drivers, and lack of compliance to any of these processes can result in an insurance liability for the armored car company. In order to verify compliance, the company should, in real-time monitor the vehicle and its drivers, and verify and report on actions against prescribed workflows and process. Tying sensors to reports, workflow, alarms and email alerts in real-time is critical for money trucks and hot loads where the load, vehicle and driver behaviors must be monitored at every step.

Dispatch then knows the exact location of the vehicle at all times, and can verify driver and back door opens and closes, cash drawer opens and closes and the sequence of these activities. Sensors and engine diagnostic data will also provide dispatch with information about ignition fire, and vehicle stop times – again, in direct relationship to

other driver activities such as door openings and closings. Finally, should there be a missed step or out of sequence activity, sensors tied to workflow trigger an alarm back to dispatch.

Avoid Liability and Fines

It is unfortunate, but a reality that some drivers may not behave responsibly behind the wheel, or operate with integrity, which can put the company and its executive and/or owner at risk. In the United States, it is increasingly common to see lawsuits associated with supervisory negligence, and fleet operators need to be on their toes to track and monitor unsafe, or illegal practices or behaviors.

Let's use the cement industry as an example, and show how external sensors can play a valuable role in verifying good and bad behaviors. When the drum of a cement mixer is rotating in one direction, it is mixing, and when it is rotating the other way it is ejecting. In this scenario, the cement company owner receives a call from a citizen that cement has been dumped in a vacant lot, and one of the company's vehicles is responsible. Through the simple attachment of an external sensor to the drum of the cement mixer, coupled with AVL GPS, the owner can verify through dispatch if the vehicle was in that location at a specific time, and verify whether the drum has been turned to the left – again at a specific time. This simple addition of a sensor to the vehicle – at the cost of pennies a day, can provide indisputable proof that can help the cement company help avoid fines and liability issues – or in worst case scenario, take corrective action.

Verify Vehicle Inspections

In the trucking industry drivers are required to make pre-trip or post-trip inspections of their vehicle to ensure safe operation. The driver typically conducts these inspections through a walk around the vehicle, and will perform tasks such as lift operation and an engine check. While this is standard practice, it is difficult for dispatch to verify that this inspection has indeed occurred, and in an issue of liability due to unsafe vehicle operation, this evidence may be required to defend the company in a court of law. The addition of external sensors to the vehicle makes the inspection process auditable, verifiable and reportable. Sensors can be installed on the hood to verify an oil check, on hydraulic lines of a cherry picker to ensure a lift operation was performed and on the vehicle gate to confirm it is secure.

Ensure Preventative Maintenance

Sensors connected to engine diagnostic capabilities, for example an odometer sensor to track mileage or a sensor to detect hard braking, along with alarms allow fleet operators to reduce costs of repair through scheduled, preventative maintenance of vehicle assets.

Verifying Work Performed

Your customer claims a delivery didn't occur, but your driver's record claims it did. Who is correct? External sensors coupled with AVL GPS can monitor a vehicle and driver's route and location, as well as provide dispatch with granular verification of delivery such as cab door opens and closes at the time of destination arrival and departure, PTO engagement of vehicle devices such as meters, hose reels, and cargo lifts can. This audit trail and reports on this activity can be extremely helpful to fleet operators and customer service professionals in resolving invoice disputes, or customer complaints.

Verification of work performed is also valuable information for monitoring employee productivity, hours of service, and vehicle pick up in unattended lots, such as in utility or field service industries. For fleets with hourly paid unionized workforces, or where payment varies based on service rendered, external vehicle sensors can be very valuable.

Ease Driver Administration & Reporting Burden

The transportation and logistics industry faces significant labor challenges. With an aging driver population, companies are finding it increasingly difficult to find, hire and train new drivers. These human resources demands are forcing fleet managers to seek ways to increase driver productivity and reduce administrative burden – as a strategy to maximize scarce resources and to attract drivers, who typically dislike administrative and reporting tasks. An AVL solution with sensor technology can help fleet operators optimize workflow and automate reporting tasks by providing a verifiable and highly granular audit trail of vehicle and driver activities, allowing for better dispatch decision to allow for more efficient routing and scheduling of pick-ups and deliveries. Sensor data and engine diagnostic information is automatically collected and stored, allowing for centralized and automated reporting which in turn, reduces paperwork (such as detailed manual documentation of hours of service (HOS) for drivers.



Resolve Disputes and Improve Customer Satisfaction

Invoice disputes and customer concerns are a part of any service based industry. The addition of external sensors however, can provide a powerful wealth of information to help ease customer concerns and resolve differences and disputes. In the consumer products industry, retail white goods are often delivered by a third party carrier, and if and when damage to goods occurs (dented fridge, or broken television screen) it is difficult to pinpoint the cause of breakage in order to resolve a customer’s concerns. By coupling external sensor data with engine diagnostic data, such as using an odometer sensor to verify actual mileage and hard braking, the AVL solution can be instrumental in identifying the cause of product damage (were the goods damaged during transport from the warehouse or not), allowing for efficient resolution of disputes between the carrier, the warehouse and the customer.

In Conclusion

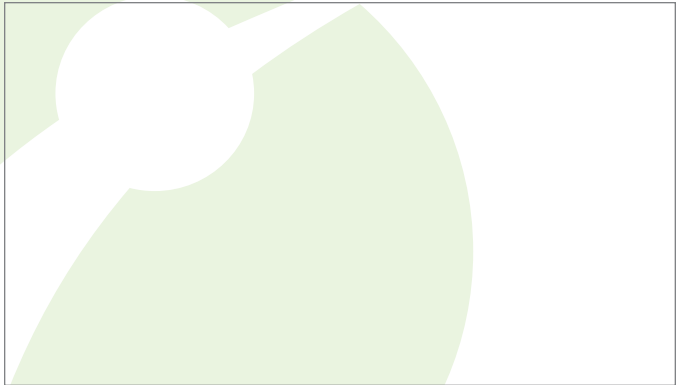
The addition of sensors to an AVL solution is an investment that costs pennies a day, and yet can pay huge dividends in terms of cost reduction, process optimization and efficiency.

When investing in an AVL solution, first ensure your vendor offers sensor technology. Then ensure your selected technology provides maximum flexibility -- to add a wide variety and number of sensors to monitor various aspects of the vehicle, engine and driver behaviors.

Sensors provide fleet operators with indisputable verification of work performed, can assist in monitoring driver and vehicle activity in real-time, and can provide granular information on overall fleet performance that can help fleet managers eke additional productivity and efficiency out of their operations and ultimately improve customer service.



Learn how BSM Wireless can help you. Visit www.bsmwireless.com or call us at 1-866-768-4771.



Building the Business Case for Sensors

Here is a summary of just some of the cost savings and benefits you can realize through the use of sensors in combination with an AVL solution. By applying your own cost analysis to these items you can quickly construct a compelling business case and return on investment model for the use of sensors to optimize performance across your fleet:

- Access PTO rebates in your state or province through the use of sensors to differentiate between PTO idle and engine idle, and to calculate total PTO engagement for a vehicle or across a fleet of vehicles.
- Improved customer satisfaction rating, through a reduction in the number of complaints and calls to customer service
- Reduced number of invoice disputes through accurate audit trails and validation of delivery, PTO engagement etc.
- Reduced overtime, and accurate calculation of job performance pay through validation of driver activity
- Accurate job costing through use of odometer readings to measure mileage, engine turn-offs
- Ensured HOS compliance, and automated capture of HOS data (duty hours, driving hours) through automated driver logs reporting
- Reduced driver and support staff administrative and paperwork overhead – and associated overtime.
- Reduced idling and gas consumption through engine monitoring, optimized routing
- Avoided legal and penalty costs through avoided liability, compliance to state and provincial regulation