



TELEMATICS SOLUTIONS AND THE PEOPLE SIDE OF THE ROI



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FleetLynx is Vecima Networks' premier Telematics and Fleet Management Solution.

This white paper is focusing on best practices when looking at deploying a Telematics solution for a Transportation, Service or Government Fleet business. Data and research materials referenced refer to the 2012-2013 calendar year.

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1 Overview – “People’s buy-in” equals ROI

Telematics solutions typically provide near real-time vehicle and mobile asset information to a fleet’s “back office” – the dispatchers, operations and safety and managers, and even senior management. The data and decisions enabled by a system permeate virtually the entire organization.

Passionate supporters have many examples to which they may point when discussing promised savings in almost all facets of a fleet operation, as some of the early Telematics Systems for trucking companies, Service and Government Fleets are moving into their second decade. There is no fleet too small to benefit due to technology advancements and significantly reduced pricing.

Deploying a system can provide wide-ranging organizational benefits, including higher customer satisfaction, improved competitiveness and productivity and increasing visibility for senior management into all aspects of fleet operations.

The major element in making any deployment a success, failure or anything in between still seems to be too often overlooked before pen goes to paper committing to a system implementation. This occurs even with all the focus on capabilities, ever-growing feature lists and integration points into logistics backend-systems and on the front-end the usage of Smartphone and tablets alike.

As with any technology implementation (especially so with certain aspects inherent in implementing a Telematics solution such as tracking time, location and driver behavior, etc.), obtaining “people’s buy-in” and commitment are arguably almost more important than the Telematics vendor of choice. Rather than just looking at a technology comparison, the area to examine most should be what tools the vendors under selection will provide you and your staff to drive buy-in, help with the ROI development and the implementation. Furthermore, what is the vendors’ ongoing commitment to supporting your organization (that is, beyond the monthly SaaS [Software as a Service] bill).

While it has been verified by court cases at various levels in both the US and Canada that a company has the right to implement a Telematics system, unless your staff are kept engaged and given the opportunity to express concerns and ask questions (possibly even the chance to “test-drive” or be immersed into a pilot phase with one or the other vendor before a full deployment), some will unfortunately, simply see this kind of system as being for the sole benefit of the company, without making the connection to what benefit(s) there might be for the staff themselves. To miss this step is not only unfortunate, but will have a significant impact on how fast a system can be fully deployed, adopted and ultimately start contributing to the expected return on investment for the company.

This coveted ROI is, to a large degree, dependent on staff not only accepting the systems’ arrival, but also their embracing the opportunities to contribute. Driver behavior and driver modifications are often the single biggest ROI contributor; less aggressive driving, avoiding idle, maintaining speed-limits and routes, maintenance of the vehicle in good working order and adhering to personal use policies directly contribute to fuel-savings.

Furthermore, adopting other practices such as replacing paper logs, expense management, POD and electronic signatures expediting billing, are all process changes that staff have to implement and adopt, thereby eliminating unnecessary paper-trails and the resulting delayed cash flow. Telematics data “feeding” into your business processes is near real-time in every way.

Organizations where staff are taking full advantage of the possibilities, not only provide better and more flexible customer service, but they do so knowing exactly how many vehicles and people they

need every day. In exchange, their staff usually ends up with more predictable working hours and/or routes that are closer to home, which provides a more equal work-life balance.

Elements of successful implementations include having staff involved in the ROI generation by providing them positive re-enforcement and rewarding the right behavior. Some buy-in arguments are easy to communicate; consider job security in a competitive environment, ROI savings going to the company's bottom line and ability to pay wages and/or turning fuel-savings into a meaningful reduction of green-house gas contribution.

The drive to induce and further positive organizational and personal change is inherent in human nature, along with the willingness to participate and be accountable; this is especially so when people have ownership in the solution. In this white paper, we will quantify some of the specific cost reductions and productivity improvements in the purchasing, training and deploying of a Telematics solution. The information in this paper has been gathered from numerous public sources as well as from interviews and customers' case studies.

For the best ROI – involve your people!

2 Focus Areas

Maximize the possibilities & ROI. This white paper provides information focused on the following areas, while incorporating aspects around your staff's buy-in.

2.1 Making the strategic Business Decision:

Unlike in the early days of Telematics systems where GPS location and near real-time wireless data were just taking baby steps, today's consumer, and with it the very people making decisions in all levels of Government and private industry organizations, have the benefit of and experience with this technology via their Smartphone, personal navigation devices, cameras and video recorders. GPS has made people's lives and the tools they use on a daily basis "location aware".

Clearly, location enabled devices undoubtedly shape today's expectations of the kind of customer service, time commitments, accurate transport estimates and optimization one could expect. This technology has also enabled a next frontier as far as competition is concerned; many view Telematics as an "adopt or perish" foundation layer for any size organization.

Some of the biggest return-on-investment benefits come from focusing on how Telematics can help your organization realize its business goals. We will show examples of how businesses can benefit from improving customer service, reducing time to deliver, eliminating delays and increasing revenue and profits.

2.2 Test your Assumptions – Pilot implementation:

"Safety First" is not just the mantra for professional health and safety; what we mean is that careful vendor selection is a must, even if you are in the market of replacing your previous system and you have some Telematics experience. An even better process is to involve your staff in the selection

process! Your decision makers need to involve their own front-line people in your organizations departments, who will work with the system and/or the data from the system on a day-to-day basis.

A defined pilot with a select two or three vendors will accomplish not only the testing of your assumptions against reality, but will also reveal weak spots that need to be overcome during the full adoption of the system throughout the organization and roll-out to all your mobile assets.

A controlled test pilot will not only test a products' suitability for your organization, but will also help cement or debunk ROI assumptions used when making the ROI case towards an enterprise-wide adoption of a system.

While compliance with the regulatory environment can be costly, less than optimal practices are often very risky this area cannot be ignored, particularly in the US with public accessibility to a company's safety scores across various categories, from driver behavior, licensing and asset maintenance to driving hours.

An automated Telematics solution for Hours of Service and Fuel Tax Reporting eliminates many costs and dramatically reduces the risk of non-compliance. When these functions are fully automated, it is feasible for a company to realize savings of hundreds of thousands of dollars a year.

With your staff's buy-in and modified driver behavior, risk reduction becomes a major part of your ROI, from lowering your insurance rate, to improving CSA scores and ensuring your brand reputation remains strong and intact.

Other aspects to consider in this compliance category can also cause headaches if not handled properly. For example, what is your take-home vehicle policy? How do you avoid tax liabilities and insurance issues resulting from un-monitored, personal use of your fleet vehicles?

Telematics Adoption: It is human nature to be sceptical regarding change and there may be an initial apprehension to the transparency inherently included in a Telematics solution. Overcoming these perceptions and reservations are critical to the realization of the benefits of a Telematics solution.

Also, your staff needs to understand the advantages gained from having this historical and real-time data available to allow them to embrace the possibilities. This includes the advantage of proactive capabilities in modelling individual job performance in order to optimize how your organization performs and competes.

Adoption is the combination of the elements learned from the control pilot phase and implementation of best practices with the system of choice. Ideally, you have also had the chance to speak with other companies in your industry about their implementations and how they avoided potential pitfalls.

Most importantly, once the initial buy-in is gained, implement incentive methods for your staff toward the metrics that you have developed in order to secure their continued participation, engrain the technology into the company's culture and ultimately, better serve your customers.

3 A Strategic Business Decision

Location enabled devices have undoubtedly shaped modern expectations of the kind of customer service, time commitments, accurate transport estimates and optimization one can expect. This

technology has also enabled a next frontier as far as competition is concerned; many view Telematics as an “adopt or perish” foundation layer for any size organization.

Some of the biggest return-on-investment benefits result from the focus on how Telematics can help your organization realize its business goals. When automated solutions are closely aligned with an organization’s strategic goals, the overall business benefit can be maximized.

It is not uncommon for organizations go through an extensive technology selection process before finalizing the goals they would like (or need) to achieve with business process automation. Ideally however, any Telematics initiative should be driven by well-defined business objectives before going into a controlled pilot with a select few vendors.

High-level objectives may focus exclusively on cost reduction or cost containment objectives, or under the right circumstances, on increasing revenue generating potential. We must note that cost and revenue objectives may not necessarily be mutually exclusive.

For example, a given process may gain efficiencies with Telematics that support either

- 1) The same output levels with fewer resources, essentially a cost reduction, or
- 2) Increased output with the same or fewer resources, an incremental revenue generation.

In either case, the process efficiency improvement should translate to quantifiable return on investment (ROI). There may be many different ways to apply automation for increased process efficiencies but we must ask, what is the value of those efficiencies? Are we automating simply because we can, or is there quantifiable value?

Clear, well-defined business objectives will help to ensure that all other key Telematics considerations are in alignment and that a Telematics technology solution delivers real ROI.

The term “automation” is often solely interpreted to mean the elimination of people from a business process. But in today’s business environment, the real challenge, and corresponding opportunity, remains in improving processes that involve people. Clearly, improving a process to create efficiencies that enable fewer required resources has a significant value proposition in any economy. But there is also tremendous opportunity to make existing resources (people involved in the business process) more effective at what they do. By extension, this drives process improvement.

It is important to find a “good fit,” in order to ensure that there are identifiable efficiency gains that can generate quantifiable value. There are “vertical” industry-specific processes, such as route selection, job/load optimization, POD capture and trigger-points for services billing which are often ripe for Telematics. There are also “horizontal” processes in virtually any company, such as dispatch, payroll, fuel purchasing and billing that provide opportunities for Telematics efficiency improvements. In general fleet operations, there many multi-step, people-centric processes that includes these characteristics:

- Highly manual
- Repetitive
- Well-defined steps
- Span multiple departments or teams
- Dependent upon individuals who have to handle work tasks and communicate with each other and/or the customer

While Telematics can provide immediate benefits in the short term by raising visibility of the fleet, reducing idling and improving fuel economy, the biggest benefits come from integrating Telematics into your strategic business goals. In this section, we will outline some of the business benefits that you can realize with a comprehensive Telematics strategy.

Comprehensive, integrated Telematics:

- Functional areas – dot on the map permeates front and back-office systems
- Competitive Edge – data to drive decisions
- Customer Service – secure your customers' business
- Accountability – company culture, measurability
- Revenue and Profitability.

3.1 Functional Areas Affected

The biggest benefit of today's advanced Telematics solutions is that they typically provide and/or enable real-time data for core organizational processes. The proverbial dot on the map for your vehicles enables the driver of the vehicle and your in-house staff to make use of the same information regarding time and location. This information touches everything from your dispatch, customer service, operational planning, fleet maintenance and any regulatory compliance you might require.

3.2 Competitive Edge

Another aspect that should experience service improvement benefits of implementing a Telematics solution is the ability to service and maintain your existing customers as well as attracting new business.

As your business processes are all interrelated, they work together to provide you with the data you need to make decisions; these include the ability to optimize and/or improve service, and also to understand cost implications for business' activities related to mobile assets, field-staff and asset maintenance. Telematics will provide the historic and real-time data you need to make cost and pricing decisions, substantiate and expedite your billing, and optimize the use of your assets.

You will be able to decide whether to offer new services and in competitive situations and you will have the data to decide if you can afford the prospective business.

3.3 Customer Service

No matter what industry you are in, being at the right place and at the right time is a customer experience expectation you simply must offer. In fact, in many cases, service contracts come with SLA's and time limits; delivering to warehouses, cross-docks or picking up / delivering loads in ports come with tight docking windows. Failure to meet those commitments will not only cost you good will with customers, but will often create additional costs in the form of penalties.

Organizations know how challenging it is to deliver on this promise each and every day with tighter budgets, rising costs, traffic woes and driver shortages. You will struggle less to contain such issues when there is an implemented Telematics solution. If something were to go off schedule or were in jeopardy of doing so, one could find the nearest vehicle in a matter of seconds.

3.4 Accountability

People will rise to a new level of accountability and will naturally work a little harder to comply with corporate standards and goals once time and location data from the fleet are visible to the organizations' staff.

Without accountability, there is no way to cost, manage or predict what is occurring in your business. With a Telematics solution, management can finally gain critical knowledge into how their entire fleet and their individual drivers and vehicles are performing.

When vehicles are moving, they are making money. Every minute vehicles or people are sitting still, they are costing money. While everyone knows about the challenge, there have been few ways to manage time in fleets, until Telematics solutions became available.

3.5 Revenue and Profitability

It is your ability to provide outstanding customer service, timely deliveries and going the extra mile that will allow your organization to position itself as the higher value provider against your competitors. Evaluating new opportunities with a view to increase revenue, and doing so profitably and letting you gain market share and/or expand to adjacent markets will be simplified by having both historic as well as real-time Telematics information.

Analysis of your customers' behavior and requirements also allows innovation of additional services that your organization might be able to offer or develop

4 Test your ROI Assumptions against reality – Pilot Implementation

“Safety First” is not just the mantra for professional health and safety. The careful vendor selection is a “must-do” undertaking, even if you are in the market of replacing your previous system and you have some Telematics experience. Involve your staff in the selection process to optimize success; your decision makers need to involve the front-line people in your organizations departments who will work with the system day to day.

A defined pilot with a select two or three vendors will accomplish not only the testing of your assumptions against reality, but will also reveal system quirks that can be addressed during the full adoption of the system throughout the organization and roll-out to all your mobile assets.

It is at this juncture where it is most important to speak with your staff across the organization and collect input; everyone might have different focus areas and with it wish list items. Doing so will ensure you select the correct vendor. With some 500+ companies in North America offering systems from the most basic to fully integrated solutions, some systems will be overkill or will not produce the ROI based on how you operate versus the best possible practices one must follow for a particular system to be most effective.

A system for first responders or taxi services will focus on faster response times and perhaps have on-board communication capabilities such as Wi-Fi hotspots. Managers of vocational fleets are looking at productivity levels based on territories, miles driven and number of jobs completed per day.

Government agencies will want to assess how many vehicles they need and will therefore focus far more on asset utilization over periods of time.

Another point of consideration is to what degree the solution you are looking at is “configurable” to serve your business realities and requirements versus forcing you to adapt your company operations and processes to fit the technology.

The generation of a short-list of companies with which you may want to engage may be completed upon the completion of strategic Business Decisions. Vendor presentations, their claims and references may ergo be evaluated with a criteria list in hand. Once completed, you should be able to narrow your choice to two or three vendors with whom you wish to pilot. Some aspect of the systems may not be feasible to fully test, but below is a check-list of items to evaluate as thoroughly as may be possible.

Elements to test thoroughly:

- Installation and on-going device management
 - Ease of install and un-install of the location device into the mobile asset
 - If you use connection to the vehicle diagnostics bus – check with your vehicle provider if they support the system being installed and ensure the Telematics install does not impact serviceability or negatively impact your vehicle warranty
 - Test across all of your vehicle types (i.e., light to heavy duty and other mobile assets)
 - What is the in-field failure rate and how does the vendor minimize impact to your organization

- Impact towards fuel savings
 - Vehicle idling
 - Speed
 - PTO data

- Fleet utilization, Asset optimization
 - Improved asset visibility
 - Knowing your cost-structure and metrics

- Vehicle diagnostics / Virtual Technician
 - Impact on vehicle maintenance – reduce down-time
 - Ability to triage vehicle break-downs and lessen customer impact

- Test the applications / test how the captured data interacts with your applications and people

- System hosting
 - Redundant hosting servers – some companies even offer geographic redundant hosting centres
 - Guaranteed system uptimes
 - How does the vendor handle software upgrades – will it affect your ability to use the system during that time?

4.1 INSTALLATIONS AND ON-GOING DEVICE MANAGEMENT

This area is fundamental to the cost of ownership, both initially and on-going. How much time vendors have spent in order to ensure a solid user experience with reliable in-field hardware will be a key element to your staff's acceptance of the system. There are clearly vast differences between systems in how much a vendor has thought through automotive grade products and installations.

There is nothing more frustrating to your employees than a "buggy" system or even sporadic, unpredictable data which skew your results. While this chapter is not so much focused on staff interaction, it is a key area; unreliability breeds doubt, hesitation and excuses, which result in a significantly impacted adoption of the system which ultimately impacts your ROI. Just as driving a car does not require your staff to be mechanics, their use of Telematics technology and systems should not require them to be Telematics technology experts.

Many of the components in Telematics devices come from cellular technology deployed in consumers' Smartphones. Smartphones, however, are meant to last a few years at best, whereas Telematics devices are meant to last for the length of time one owns the vehicle, which is typically an average of 5 years. Unless the vendor has rigorously designed, tested and bought top quality electronic components, the product while perhaps performing initially, will see in-field failures increase, or have an immediate or initially high failure rate.

Once your company relies on sub-par Telematics data, you will find that any system going out of service will cause you to have to diagnose the problem; you will lose time and money. Even more detrimentally, your drivers will have to revert to alternative (paper) processes for the time out of service. So it is important to cover off a number of points, from ease of install to the ruggedness of the device.

It is also worth asking your selected vendors to explain to you how the system is being monitored. More advanced systems have built-in "heart-beat" and self-monitoring capabilities, where you will obtain proactive notification of tracking device issues. This also allows you to discover if you might have coverage issues, where the device goes into store and forward mode when not connected to the cellular network. Solid remote diagnostic capabilities are key, since any time a driver reports a problem, you need to be able to rely on your or the vendor's ability to diagnose problems without having to return the vehicle every time. Not being able to do that can cause immense frustration between your drivers and fleet operations. It would also show possible tampering with the device, for example, antenna disconnects or battery disconnects.

Once the device is installed and in-field, observe how easy is it to deploy future embedded firmware upgrades or change the configuration profiles of your tracking devices. Advanced systems have automated deployment management, where software upgrades can be queued up and the system takes care of the deployments. Advanced systems will not require you to turn on your vehicles and idle for extended lengths of time; OTAs are handled automatically between the backend servers and the device while the vehicle is being operated. OTA packages (the amount of data consumed) are optimized so as not to cause you to pay for undue cellular overage charges.

In addition, since many of the newer Telematics devices are meant to connect to your vehicle's diagnostic bus, it is critical to choose a vendor where such an install does not cause problems with the regular maintenance services offered or suggested by the manufacturer's dealer. In worse case scenarios, installations void the vehicle warranty due to the method in which the device might be wired. We consider it is a very good idea to speak to and obtain your vehicle dealer's advice. Entrenched Telematics systems with a good quality track record are more likely to be recognized and accepted. In addition, several vehicle manufacturers have established relationships with Telematics companies and have qualified their systems for use with their vehicles.

Regardless of the fleet size being deployed, question vendors as to which installer network they utilize and ensure that it covers your geographic area of operation sufficiently, so that you do not incur huge trip-charges later. Some vendors will also allow companies with appropriate skill sets to self-qualify and then handle their own installations; even then, it is important to cover off all the steps necessary – from the physical installation to the method in which the devices are activated.

Lastly, as your Telematics system will become such a fundamental tool that permeates your entire organization, you will need to ask vendors how they plan to shield you from technology obsolescence since technology changes very rapidly. Some vendors offer so-called Evergreen plans, where technology renewal is built-in to certain pricing models; for example, devices rendered obsolete due to cellular network changes, or general 4 or 5 year rotation plans can be purchased as technology renewal options.

To recap:

- Ease of install and uninstall of the location device into the mobile asset
 - How long does it take to install and wire the device initially; are there any pre-fabricated wiring harnesses available; avoid cutting and splicing of cables especially when connecting to the vehicle diagnostics bus.
 - What are the steps to un-install and re-install a device (e.g., in case of device failure).
 - Ensure the device is securely attached to the vehicle; some vendors offer base carriers into which the tracking device “snaps.” This is important, as with the vehicle vibrations, the device needs to stay securely in place.
 - If you have to install sensors and other I/Os, ensure you have solid installation estimates, otherwise these can become expensive surprises.
 - Test all required sensors, inputs (e.g., temp probes) and hydraulic sense to determine if they meet your functional requirements. For example, are the temperature probes able to withstand the harsh cleaning agents used in food services and do they deliver the temperature sampling in an adequate resolution?
 - If you use the connection to the vehicle diagnostics bus, check if your vehicle provider supports the system being installed; ensure the Telematics install does not impact serviceability or negatively impacts your vehicle warranty.
 - Test across all of your vehicle types (i.e., light to heavy duty and other mobile assets).
 - Vendor’s installer networks need to sufficiently cover your area of operation, otherwise there could be hidden services / time-delay costs down the road when installers have long travel distances to your vehicles.
- What is the in-field failure rate and how does the vendor minimize impact to your organization
- What device diagnostics capabilities are built-into the system:
 - heart-beat
 - device connectivity
 - GPS fix / no-fix
 - antenna and battery disconnects
 - OTA; Over the Air software upgradeability and what is required to do so (e.g., how easy or cumbersome will it be to push a new firmware upgrade to your fleet?)
- How does the vendor protect you from technology obsolescence?
 - Typical device-life is 5 years; does the vendor have a technology renewal or “Evergreen-Plan,” keeping the location hardware current, either as option or already baked into the solution fees?

4.2 IMPACT TOWARD FUEL SAVINGS

Most fleet operations managers will anticipate fuel savings as a significant factor of their initial ROI case. After all, regardless of the kind of fleet you operate, fuel ranks in the top four or five cost areas.

Implementing a Telematics system can improve efficiency, through the creation of changed and adopted driver behavior. Fuel savings of ten, twenty, or even twenty-five percent are possible. The best practices established today call for positive reinforcements, from proactive coaching and driver rewards programs (for example, via travel / air miles) to embedding driver behavior into performance-based pay.

Speeding and aggressive driver behavior, as well as idling on stops and waiting for loading and unloading are the biggest contributors to fuel waste. Indirectly, speeding and aggressive driving contribute to a higher insurance risk as well as higher maintenance costs for the vehicle.

Programs can include a scorecard with six to eight metrics, including safety, compliance, on-time service, fuel economy, idling, load acceptance and the accuracy of drivers' planned time-of-availability messages that are sent to dispatch.

Fleets can create trustworthy pay-for-performance programs by using integrated systems to score driver performance and deliver scorecard analytics in a timely manner to drivers. All drivers, regardless of tenure, have an equal chance to boost their pay.

Other incentive methods could be that drivers with higher scores will be given more driver-friendly freight as a reward. The scores could also be used to prioritize driver-load assignments based on customer service needs. Drivers with higher scores would be assigned to customers with more time-sensitive freight.

It is best to have automated methods of frequently updating the driver about their performance; some systems allow that to occur when logging in for shifts and/or allow for direct log-on via Smartphone or in-cab mobile data devices. Some companies also publish driver compliance records and scores in driver lounges and/or via electronic newsletters.

Fleets can give drivers an equal opportunity to view their performance and make necessary course corrections by using the latest trends in technology convergence between the office and cab.

The EPA Smartway program* provides some guidance regarding speeding and idle. For vehicles on the highway, one of the most effective ways to improve fuel efficiency is to reduce maximum speed to 60 mph or less. There is a direct correlation between speeding and fuel economy. If you are currently averaging 5.75 mpg on the highway, reducing average speed from 62 mph to 61 mph would result in a 0.12 mpg improvement. A good rule of thumb is a 0.1 mpg improvement for every 1 mph reduction in speed over 55 mph.

According to the EPA Smartway Program:

- Idling times should not exceed 12%.
- An achievable target for idle time is 5% to 7%.
- Each 1 mph decrease = about 0.1 lower mpg.
- At speeds over 60 mph, fuel economy loss is greater than the time savings.
- Higher speeds increase engine and tire wear.

There are also various Eco-Driving programs available, varying in length and time commitment from a few days to comprehensive twelve week programs. Drivers participating in these programs not only noted significant improvement in fuel economies, but also noted their overall stress-levels being reduced at the same time.

4.3 FLEET UTILIZATION, ASSET OPTIMIZATION

Any fleet, regardless of size, without a Telematics solution has no visibility into how their most important assets are performing; this applies to the vehicles and the mobile work-force alike.

In addition, it is not only your staff's performance that impacts operations, but also often your own customers, where your employees might encounter delays in loading, unloading or performing service tasks for many reasons.

Having clarity and as much automatic data collection as possible regarding these issues allows you to deal with facts, rather than letting guess-work relegate you into unsatisfying resolutions to problems. Instead, the real-time data available will let you work with your staff and customers to remove bottlenecks and improve customer satisfaction.

You will benefit from other supporting data sources with the more advanced system's modules, such as road traffic data, weather forecasts, etc. Systems also allow your dispatchers to optimize routes based on the time of day, as well as vehicle attributes such as weight, height, width and other such factors.

Your front-line staff and management will have an automated method of tracking and reporting on the fleet with an implemented Telematics System. Consider the many areas in which real-time information touches the processes in your organization:

- Dispatchers instantly know driver / service technician availability, including nearest vehicle available to respond
- Your sales department will be able to prepare quotes based on historic information, such as what is your road-mile minimum cost? Do you know how to charge more for rush-hour deliveries? What are your metrics and cost-structure?
- Operations may maximize utilization of your vehicles and keep just enough spares to cover emergencies
- Does your maintenance department know when to schedule vehicles into service? They could be proactively notified of a pending vehicle failure and be better enabled to triage a road-side break down where there is integration to vehicle diagnostics
- Enable the selection (and ownership) of the right vehicle for the right job by optimizing matching vehicles to the loads you carry and the jobs you do for your customers.

4.4 VEHICLE DIAGNOSTICS / VIRTUAL TECHNICIAN

Typical maintenance programs run based on vehicle mileage intervals; for other motorized assets such as construction equipment, the programs run based on engine hours. Another method utilized to catch developing deficiencies is by using the data pre- and post-trip inspection reports provided by the drivers.

Clearly, the desire is to detect issues early, when repairs are less expensive and to avoid the need to have vehicles out of commission for extended periods of time. Days out of Service (DOS) costs can climb as high as \$600 per day for a class 7 or 8 truck.

Connecting the tracking device to the vehicles' diagnostics bus (essentially a serial communication between the various engine computers) can allow the system to capture trouble codes, providing insight into issues in real-time. Often, trouble codes are captured before the actual "check engine" light in the vehicle is triggered; thus, drivers can be notified before major issues develop. If there is something wrong with the vehicle such as over-heating, it will not be forced to the point where the engine is put at risk for extensive damage and repairs.

Save technicians time and allow them to quickly complete repairs by adding the vehicle diagnostics option to a Telematics solution that enhances communication. In some cases, advanced systems essentially enable a "virtual technician" functionality, where fault-codes are automatically interpreted and suggested repairs / triage nodes are provided to a call-centre based technician; this technician can then determine how critical the problem may be or might become, and then determine action to be taken.

- Impact on vehicle maintenance, reduce down-time
- Ability to triage vehicle break-downs and lessen customer impact
- Ensure the system you chose is acceptable to the manufacturers and dealers of the vehicle you have in your fleet

4.5 DATA INTEGRATION / APPLICATIONS

One of the major aspects of any Telematics implementation is to take a close look at the applications the system has either embedded already, and/or to which it provides plug and play interfaces.

The system already provides pieces; in cases where this is not so, those tie-ins can be easily established with the payroll system, the billing back-end and the maintenance management system.

It is best if you follow the paper trail of anything currently communicated by your drivers and mobile staff to the office (e.g., proof of delivery documents, fuel and expense receipts, time sheets) as well as anything that your back-office delivers to the drivers and field-staff (e.g., job / load assignments, bill of lading, customs paperwork).

Ensure that the interface options offered will work for the number of vehicles in service and transactions you perform and test how the captured data interacts with your applications and people. Also ensure there is transparency regarding pricing for applications and interfaces.

In addition, ensure that the system is truly scalable to support your entire organization; request references from the vendor of companies that are the same size or bigger than yours and check with them as to whether or not they experience any latencies in any aspect of the system, from tracking / map updates to the ability to run on-line queries and reports (e.g., a system that archives data every month is obviously far less useful than a system that provides you with on-line, real-time access to 1 or 2 years worth of all your operational data).

4.6 SYSTEM HOSTING - SAAS

As noted earlier, once the data is embedded from the wide-ranging Telematics systems into the organization's processes and applications, it becomes an absolutely critical business tool. Since most

systems are provided as hosted systems (i.e., not hosted behind your firewall but by the third party provider of your application), it is of the utmost importance that you check every aspect of your application vendors' hosting capabilities.

Not every vendor's system and processes are created equal; much depends on the quality of the hosting environment, redundancies afforded, and server capacities. Advanced systems of well-funded Telematics companies offer SLAs (i.e., Service Level Agreements that detail the major aspects of the remote hosted solution and information regarding uptime guarantees). You should be looking for 99.9% (if not 99.99 %) system uptime and not just select parts that the vendor might deem critical. Read the fine print; does the uptime include your data interfaces to other applications and does it include your ability to run reports at any time during the day, or are you perhaps limited to certain time windows only? Does the vendor have to temporarily suspend service for regular software upgrades? How often are upgrades required and what is the notification process?

Checklist items:

- Are there redundant hosting servers; some companies even offer geographic redundant hosting centres
- Guaranteed system uptimes
- Obtain an SLA that spells everything out
- Software outage – ensure you get that for which you are paying.
- How does the vendor handle software upgrades and will it affect your ability to use the system during that time?
- Are there limitations for when you can run comprehensive reports (e.g., queries that might cover many or all of the vehicles in the fleet, versus ad-hoc queries for just one or a few vehicles)?

5 Regulatory Environment

Compliance with the regulatory environment is costly and less than optimal practices are risky. This area cannot be ignored due to the growing awareness of shippers, the public, in regards to regulations and CSA enforcement. CSA scoring can be easily consulted using a company's DOT license number; the website provides detailed information about safety scores across various categories, from driver behavior, licensing, drug testing and asset maintenance to driving hours.

An automated Telematics solution for Hours of Service and fuel tax reporting will eliminate many costs and dramatically reduce the risk of non-compliance. When these functions are fully automated, it is feasible for a company to realize savings of hundreds of thousands of dollars a year.

Staff buy-in and modified driver behavior are contributors to ROI; risk reduction is a major factor contributing to the ROI, from lowering your insurance rate and CSA scores to ensuring the strength of your brand reputation.

Other aspects to consider in this category can also cause head-aches if not handled properly. For example, what is your vehicle take-home policy? How do you avoid tax liabilities and insurance issues resulting from un-monitored, personal use of your fleet vehicles?

In this section we will focus on:

- Pre- and Post-trip inspections
- Hours of Service

- Implementation and training – what to look for
- Fuel Tax filing
- Take home vehicles and personal use policy
- Distracted driving legislation
- Insurance

Sometimes the various compliance areas intertwine; for such an example we can turn to the case of Tiburzi v Holmes. This case involved Jeffrey Knight, who was a driver for Holmes Transport & Logistics and Mark Tiburzi, who was driving his personal vehicle at the time. Knight caused an accident that injured 15 and killed three in St. Louis, Missouri; one of those injured was Tiburzi, who suffered severe traumatic brain injury. The causes of the accident were many. Along with excessive speed and driving over the allotted on-duty hours, distraction was blamed; Knight had looked away from the road to check his cell phone. The jury awarded Tiburzi \$18 million to be paid by Knight's employer.

5.1 PRE- AND POST TRIP INSPECTIONS

Both private and public fleet vehicle drivers need to complete various check-lists and inspect vehicles thoroughly before taking them on the road.

Vehicle inspections and the pro-active maintenance resulting from those inspections are not just a compliance issue, but can really help you control costs and keep your drivers safe on the road.

A properly executed vehicle inspection can help drivers:

- Discover unsafe conditions before they result in costly breakdowns and vehicles being out of service
- Avoid being subjected to infractions, costly fines and placed out of service during a DOT inspection
- Discover unsafe mechanical and other conditions before they put your staff at risk of accidents or crashes
- Maintain a safe, clean vehicle that does not drip all sorts of fluids, helping to protect the environment

It is the best practice to subscribe your drivers and mobile employees to a regimen of a complete pre-trip inspection at the beginning of the day, a walk-around inspection when the vehicle is parked and also a post-trip inspection at the end of the day.

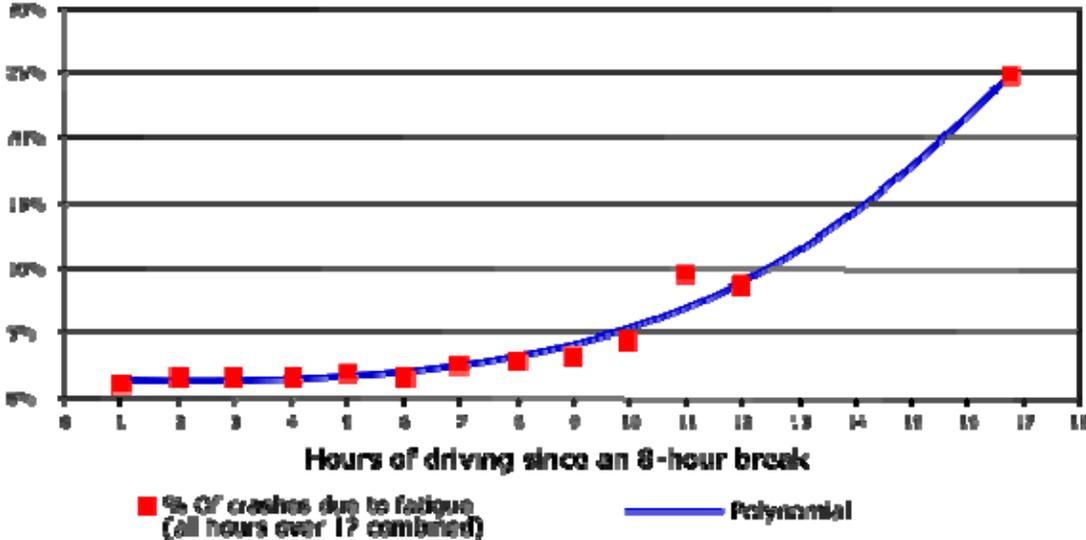
These checklists are quite extensive for medium and especially so for heavy duty vehicles. While for light duty vehicles, the list is relatively short. Your drivers and mobile staff also need to know for what they are looking. The lists cover everything from lights, brakes, tires, fluid levels and fluid leaks to the display of appropriate permits and stickers on the vehicle itself.

Advanced Telematics systems allow you to put the equipment check-lists on Smartphones and Tablets, so that drivers have it before them when they do the walk-around. In addition, since information is now electronically captured, data can flow directly into your maintenance department, which saves time and avoids paperwork and information gaps.

5.2 HOURS OF SERVICE

The purpose of the HOS is to reduce accidents caused by driver fatigue. As the graph below illustrates, the number of hours spent driving has a strong correlation to the number of fatigue-related accidents. According to numerous studies, the risk of fatigue is also greatest between the hours of midnight and six in the morning and increases with the total length of the driver's trip.

Percentages of crashes due to fatigue as a function of hours of driving



Drivers subject to the HOS include any driver of a vehicle which has a gross vehicle weight of 10,001 pounds (4,536 kg) or more; which is designed or used to transport more than 8 passengers (including the driver) for compensation; which is designed or used to transport more than 15 passengers (including the driver) and is not used to transport passengers for compensation; or which is used to transport hazardous materials in quantities requiring the vehicle to be marked under hazardous materials regulations.

Increasingly, there are software applications available for Smartphones and Tablets that replace the common paper logs. While these “soft-forms” are able to automatically calculate a number of things, including warning of upcoming driving hours violations, they usually still need to be printed and signed in order to be accepted as legal and binding documents.

Actual Telematics systems integrated vehicle-mounted on-board mobile data terminals with HOS e-Logs almost 8-10 years ago; however they were closed, proprietary systems with little flexibility. More recent systems now are highly configurable to particular HOS rules and exceptions (e.g., Oil and Gas, Agriculture and various State / Cross-border regulations) and also offer extensive advanced notifications of up-coming drive-time violations.

The biggest challenge, however, is driver training and driver acceptance. This touches an area of regulatory compliance; you really need to get all drivers to adopt and embrace the system, even if it takes some time. Since you will have to run a dual system between staff on the system and staff that use paper-logs, this will actually cause extra work until the system is fully implemented. This needs to be well planned so things do not fall through the cracks. One of the biggest changes will be that drivers will need to spend time logging into the system in the morning. It is also critical to make appropriate level of training available to new fleet drivers.

Overall, once on the system, the time spent on paperwork and/or checking back with operational staff is greatly reduced. The real ROI noted by companies varies, but amounts, on average, to \$1000-\$3000 per driver per year.

It is definitely beneficial to get ahead of the implementation curve as the US Federal Government is working on legislation to have the industry implement mandatory EOBR (Electronic Onboard Recording Systems) within the next few years on all new vehicles bought by a fleet that is required to follow HOS regulations.

Also, with the implementation of CSA, where the public and your customers can look-up various compliance areas and your company's operating scores on-line, it is clearly important to utilize technology in order to have a solid compliance record. It will cost your business to do otherwise, as nobody wants to be associated with the traffic wreck on the evening news; even more detrimental is that it might clearly show your brand on the side of the wrecked trailers or vehicles.

There are immediate benefits to companies who adopt electronic HOS logs or even fully 395.16 compliant systems today:

- Companies with solid records qualify for fast-pass programs at the scale
- Lower scrutiny by enforcement authorities. Companies report that once it was known that they had converted their entire fleet to an electronic solution, they are stopped less frequently. Some display decals of their brand system on the side of the vehicle. Also when they are stopped, they are stopped for much shorter periods of time.
- There is lower risk of being audited.
- If they are audited, there is a high probability they will be 100% in compliance with all HOS rules and regulations.

5.3 FUEL TAXES

Not all companies running fleets are subject to fuel taxes. Fuel tax filing is also an issue decoupled from HOS, however companies requiring their drivers to keep HOS logs often also file fuel tax reports.

Capturing the required data via paper process is a significant burden, as one needs to track the exact details of where fuel was purchased and where vehicles have actually been driving. This consumes both administrative and driver time to complete and monitor the paperwork.

Typical fleets report that drivers are spending between ten and fifteen minutes every day filling in fuel tax paperwork; administrative staff in the office need another 0.5 to 1 FTEs daily per 150-200 trucks. Having your reports complete, accurate and electronically submitted on time every month will ensure your fuel-tax rebates are quickly received in your bank account, therefore improving cash flow, as it relates to one of the biggest expenditures.

Penalties for inaccurate fuel-tax reporting can be very expensive; companies filing manual records take a significant risk in doing so. Worse, once inaccuracies compel a fuel tax audit, it is difficult to predict how long and costly the resulting audit will be. Telematics real-time data provides the data for summary filing and in case of an audit, a simple method to obtain more detailed information by allowing you to "deep-dive" into your data for any specific situation..

5.4 TAKE-HOME AND PERSONAL VEHICLE USE

Service Fleet Trucking companies, or sometimes even Government Fleets, allow vehicles to be taken to employees' homes. This might be for operational efficiency (so the employee can start the work-day directly driving from home to the first assignment), or may be meant as an employee benefit for the commute from and to work, but is not necessarily sanctioned for afterhours or weekend use.

Ensuring proper definitions, process and documentation are often overlooked amid a usually well-meaning "we trust you" attitude.

However, overlooking these factors may result in incidents that cause unpleasant surprises for your employees and your company. While you might have meant well, you are exposing yourself and your employee to possible insurance risks and tax liabilities.

There are plenty of examples where lax policies have resulted in major financial pain; for example, when the corporate insurance company declines to cover accident damage during weekend vehicle use or where a tax audit assesses several years' worth of back-taxes (when for lack of a vehicle use policy it is deemed a taxable benefit) where in fact, the employee might have not even been able to enjoy such benefit.

Best practices suggest sitting down with your employees to clearly discuss what is intended, allowed and to draft up a clear policy that is mutually acceptable, yet protects everyone's interests and chequebooks.

5.5 DISTRACTED DRIVING REGULATIONS AND POLICIES

It is imperative to have firm policies in place for the use of cellphones, with the arrival and enactment of various distracted driving laws in North America, and also around the World.

These laws are often passed in various jurisdictions because of accidents resulting from distracted driving incidents, where drivers were using mobile devices. Media coverage of these incidents further spurred these legal changes.

It was a multi-million dollar law suit for one of the world's largest beverage and snack food companies that made the headlines in 2012; an off-duty employee caused a significant accident in a company vehicle. The plaintiff's attorneys were able to successfully argue that the company's cell phone policy for its drivers was "vague and ambiguous."

Not only is it hazardous to those behind the wheel, if the driver is talking on a work-issued phone, about work-related issues, or driving a company-owned vehicle, the company stands liable.

The challenge is also inconsistent with some of the legislation passed; some jurisdictions have focused on texting and emails, while others cover hands-free operation of phones.

Where this area intersects with the selection of a Telematics solution, is that several companies provide text-to-speech and speech recognition for their proprietary in-vehicle mobile data terminals. In addition, Smartphone and Tablet applications accomplish the same thing, hands-free communication between the driver and the company, to the degree allowed.

Whether your company only uses Smartphones for the tracking application, or a fully vehicle integrated solution, you need to work with your staff to ensure that everyone is aware, trained and in compliance at all times.

Even with all the policies and procedures in place, your staff needs to buy-in 100 percent and understand the risk at which their non-compliance can put their work-place, themselves and others with whom they share the road on a daily basis.

5.6 INSURANCE

Clearly, driver behavior will have an impact on any cost associated with having sufficient coverage in place, regardless if your organization is self-insured or obtaining insurance via a provider. Since this white paper is also focusing on the people element around Telematics, having solid processes and procedures in place around safely operating company vehicles and equipment are very critical to your employees' health. As noted in the introduction to this section, not having policies and tools in place to ensure safe operation can dramatically backfire, in cases of crashes and accidents.

It would be beneficial to have a conversation with your agent regarding whether or not there are possible premium benefits if you are willing to share anonymous driver behavior data with your provider, as there is an increasing awareness of Telematics Systems among North American Insurance providers.

Several insurance providers also offer premium reductions to commercial fleets when they implement a system and possible sharing of some of the data, just as Progressive Insurance practices in the consumer space with teen-driving and defensive driver credits.

This goes to the ROI in several ways, from providing a safe operating environment for your employees, to hard dollars in the form of possible insurance discounts.

6 Telematics Adoption

All organizations face challenges when deploying new technology. In order to realize the return on the investment of a Telematics solution, people, processes, and systems in an organization must adopt the Telematics deployment. Many organizations only realize a fraction of the potential of Telematics, because there was no planning around the entire adoption throughout the organization; this may also occur when the original momentum gained from the controlled pilot roll-out is not maintained in the long-run due to lack of processes and programs that keep it at the forefront of the mind on a daily basis.

It is absolutely human nature to be sceptical regarding change implementation and the tendency remains to treat one's real-time location as a cross-over into private life. Overcoming perceptions and reservations are critical to realizing the benefits of a Telematics solution. It is solid practice to develop select staff involved in the initial control pilot into the in-house "change messengers" or domain experts and have them involved in the greater roll-out plans as on-going evangelists.

Better yet, as part of the communication developed around the roll-out, your staff needs to understand the advantages to be gained from having this historical and real-time data available and embrace the possibilities; they also need to be proactive to model their individual job performance and optimize how your organization works and competes.

Adoption really means bringing all the elements learned from the control pilot phase and implementing best practices with the system of choice. Ideally you have also had the chance to speak with other companies in your industry about their implementations and how they avoided pitfalls.

Once the initial buy-in is gained, implement ways to incentive your staff towards the metrics that you have developed so that their continued participation is secured and the technology is engrained into the company's culture and how you better serve your customers.

Changing peoples' behaviour, and doing it in a positive way, can be a challenge. Our customers and independent case studies show that the following five key considerations, as a whole, make for successful adoption:

1. Defining and aligning clear business objectives
2. Involving the right people
3. Automating the right processes
4. Using the right technology
5. Supporting "quick win" as well as continuous improvement initiatives

6.1 BUSINESS FIRST

While there may be specific problems that Telematics solutions solve, the biggest benefit to organizations deploying a Telematics solution is the data needed to achieve critical strategic goals for the company. Focusing on these business goals keeps everyone in the organization focused on these strategic goals and the benefits that everyone will accrue.

We have covered many of the major areas under the ROI assumptions section earlier, but generally the major areas are:

Vehicle Utilization

1. Manage fleet size
2. Vehicle reassignment
3. Reduce number of rentals
4. Create vehicle pools for short-term use
5. Make informed vehicle replacement decisions
6. Assign the right vehicles for right jobs
7. Track unauthorized vehicle use (e.g., location, after-hours use)

Vehicle Maintenance

1. Improved preventative maintenance
2. Improved corrective maintenance
3. Increased safety during vehicle operation
4. Identification of poor performing vehicles/parts for warranty
5. Identification of vehicle tampering or misuse

Operational and Environmental Impacts

1. Reduce fuel consumption
2. Decrease non-productive idle time
3. Improve driver performance
4. Increase fuel economy

5. Decrease emissions
6. Track fuel costs
7. Achieve optimal routing
8. Maximize fuel tax credits
9. Increase compliance

6.2 TRAINING

An entire white paper could be written on the topic of driver training. The key is that senior management is committed in the long term to initial and ongoing driver and staff training. For drivers and your mobile field-staff alike, often the biggest challenge is modifying existing habits. Drivers need to be shown the basics, such as logging in and logging out of their Multi Display Terminals.

The next change is making field-staff and drivers aware of the critical importance to the entire organization of recording events as they happen. Applications available on Smartphones, Tablets and Mobile data Terminals of the more advanced Telematics Systems make this as simple as possible, but staff still need to record events. Events include common activities, such as arriving and leaving pickup or drop-off locations.

6.3 STAFF COMPETITION

Using competitive scales can be a powerful way to motivate people into changing their behavior. Best practices suggest that a key to any sort of measurement scale or competition is that it be seen to be fair to everyone involved.

In the Collins Travel ECODriving Case Study^{xv}, Collins Travel in Ireland implemented a successful Telematics solution. Management committed the company to written policies on the following:

- Fuel usage and waste
- Idling
- Driving practices

In collaboration with drivers, targets and bonus scales were established. Management hired Loni Byrne, as Energy Manager; he motivated and mentored the drivers to ensure that the targets were met. This included a monthly review process, including mileage. Drivers had access to their own scores through a tracking system on their mobile phone.

“Collings Travel in two years has achieved 29% savings on diesel fuel.”^{xvi}

7 READY TO ROLL

Barriers to Telematics solution adoption are usually regarding how people accept change. Individuals will come on board to make the necessary changes to adopt new technology when the focus is on awareness and business issues. Training, monitoring and feedback give people the confidence to deploy and use Telematics solutions. It is possible to drive improved business results by using people’s natural inclination to be competitive. To do so, the process must be seen to be fair to everyone involved.

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