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Integrating Telematics into Fleet Safety: Part of a Fleet Safety Program

Tracy O. Linhart
Safety Manager
Premier Beverage Company LLC
Ft. Lauderdale, FL

Introduction

During the summer of 2009 the Safety Manager of Premier Beverage Company, along with the Charmer Sunbelt Risk Manager, analyzed the cost of crash incidents for the previous years. Through their analysis it was determined that a solution utilizing a technology based system was necessary to focus on the need to reduce losses, mitigate risk, and aid in lowering operating costs while generating a favorable return on investment (ROI). This paper will give an overview of Premier's business, define telematics , describe a wide range of alternative electronic solutions for reducing crashes, examine the decision process for implementation, review the program's installation and operation at Premier, and weigh the first year's results.

The process required to implement any new program that will require changes to driving behavior will vary from company to company depending on the maturity of the safety culture. (Phillips 30). Due to increased loss trending in 2009, Premier considered evaluating telematics programs, along with other technologies, in order to improve driving skills, improve incident rates, lower costs, and increase the ROI. There are many tools to help the safety professional evaluate available options through educational opportunities and utilization of consultants and insurance companies. The analysis of the current fleet safety program included the answers to the following questions:

- Are resources spent to update training materials, and/or invest in an on-the-road instructor coached in-cab training program?

- Is there a technology that has been proven at other companies to lower cost and has a proven ROI?

  Will the company's insurance partner endorse and support a technology- based solution in order to improve the company's incident rate?
- Will upper management support safe work initiatives that will incorporate the new technology?

- Will the corporate office have a safety champion working with the safety professional?

After considering the preceding questions, the choice of a telematics solution was the decided action to enhance Premier's existing safety program (Long 16).

The safety management team came to the conclusion that a system which incorporated in-cab-feedback would be the best fit for Premier (Geller 220). This system would help transform the driving culture and focus more attention and effort towards improvement of on-road safe driving, with driver accountability through the driver's own self-correction of unsafe driving maneuvers (Flatow 26). Following the installation of a telematics system, risky driver behaviors were reduced by 75%, resulting in the reduction of claim occurrences of 31%, and a further reduction of claim costs of 74% over the first twelve month implementation period. During this same time period, overall miles per gallon (MPG) increased by 5%. This is the story of how these successful results were achieved.

Who is Premier Beverage Company LLC?

Premier Beverage Company LLC is part of The Charmer Sunbelt Group (CSG), one of the nation's leading distributors of fine wines, spirits, beers, bottled water, and other non-alcoholic products. It operates in eighteen markets in seventeen states. (Daecher 2004) Premier Beverage has warehouse /cross docks in eight cities within Florida. The truck fleet is comprised of three types of vehicles: tractor-trailers, straight-trucks, and panel vans.

- Annual revenue $4.1B
- Distributes over 11 million cases per year
- Employee work force of 1,200 associates

While continuously upgrading their facilities, currently Premier has:

- 167 temperature-controlled truck fleet
- 67 cargo van fleet
- Warehouse Management Systems
- GPS routing system

WHAT IS TELEMATICS

telematics [tɛ/ɪ/mætɪks] *n*

(Electronics & Computer Science / Telecommunications)
(functioning as singular) the branch of science concerned with the use of technological devices to transmit information over long distances
[from TELE- + (INFOR)MATICS] (Telematics1 2012)

Telematics originally was concerned with the convergence of telecommunications and information processing, however, the term later evolved to refer to automation in automobiles. GPS navigation, integrated hands-free cell phones, wireless communications, and automatic driving assistance systems are all telematics. General Motors was the first automobile company to combine GPS with roadside assistance and remote diagnostics through their OnStar system. *(Telematics2 2012)*

The backbone of modern telematics technology is the Global Positioning System (GPS). Companies have found many uses for GPS, such as clock synchronization, and Geofencing vehicle tracking systems. For our definition we are using telematics to describe a GPS system combined with cellular technology, and a black box that collects data to be transmitted to a server where the information is stored and manipulated by the telematics company, then displayed on demand on any computer screen in a dashboard configuration for use by the company's management team and drivers.

Wide Range of Available in-Cab Technologies

Premier was considering a comprehensive list of in-cab technology for alerting drivers to unsafe conditions and unsafe driver actions (Huang, et al 22)

- Collision avoidance/warning system: Sensors mounted in and around the car constantly scan to detect other vehicles or obstacles. When an obstacle is detected the system determines whether the vehicle and driver are in danger, and if so, a warning tone, warning light, or heads-up display will activate.
- Adaptive cruise control: A combination of collision-warning integrated with the cruise control. The system will automatically maintain proper following distance.
- Lane tracking or lane departure warning: If the vehicle moves to the edge of the roadway an audible warning will sound. Some systems can track the lane markers and then give the driver a warning if he is crossing the line without the proper turn signal. Some systems can sense a driver's lack of alertness by detecting his erratic steering, or weaving.
- Side sensing (proximity) devices: Using similar devices as used in collision avoidance/warning system. The devise gives an alarm to assist in preventing sideswipe crashes.
- Vehicle and cargo tracking systems: Uses GPS to track the vehicle and broadcast the information to the transportation company. This allows the company to not only track the progress of the driver, but to return the data to an intuitive routing system.
- Driver awareness monitors: Using the driver's eyelid movement blink rate, head movement, or steering wheel movement, (or a combination of all three) to determine the alertness of the driver.
- EDR (in-vehicle event recorder or black box): The EDR is constantly recording information related to vehicle performance. Information such as air bag deployment, seat belt use, driver's steering, vehicle speed, acceleration, and many more data points. The EDR can trigger automatic collision notification.

- In-vehicle cameras: Cameras record, but do not save, all images unless a company's pre-set g-force is exceeded. Once that level is reached, the record is saved and then can be used for positive feedback to the driver.
- In-vehicle feedback system: Lights and/or audio feedback is given to the driver immediately after an unsafe driving event occurs. The feedback limit is preset and determined by the size, type, and model of the vehicle.

The decision process

The following are fundamental questions regarding the decision making process for implementation of a telematics technology program:

Fundamental questions to ask about the proposed program (Phillips, J. 10)

- Why is this an issue
- Are there multiple solutions
- Who will support the program
- What happens if we do nothing
- Are there important intangibles
- How much will the solution(s) cost
- How can we fund the program
- Is there a potential payoff (ROI)
- Is this issue critical
- Is this issue linked to strategy
- Is it possible to correct rising losses
- Is it feasible to improve rising losses
- How much are rising losses costing are company
- Can we find a solution
- Driver acceptance
- Adaptable across workforce generations

Obvious outcomes

- Reduced insurance cost
- Reduced maintenance cost
- Reduced fuel consumption
- Improve incident rates of crashes
- Improve incident rates of injuries
- Focus on safe driving behaviors
- Recognition for safe driving
- Verifiable route sheet times

Not so obvious outcomes

- Improve leadership competencies for all managers
- Train all divisions on critical conversations

- Implements standardized policy for driver standards
- Become a technology leader
- Create a safer place to work
- Ability to know when the vehicle is moving
- Ability to monitor location
- Built-in capability for future growth
- Replacement of older generation GPS system

Implementing Telematics into Fleet Safety

After working through the decision process the Premier safety management team chose a system that fulfilled their assessed needs. This system will be effective in reducing crashes, be cost effective, have minimal hardware and software cost, add no cost for IT infrastructure, be easy to use, exception based, scalable, includes a management information system, and have a positive provable ROI that includes cost reduction and cost avoidance. (Phillips J. 9) The installed telematics hardware will be small enough that it could be mounted in the cab without causing any diminished visibility for the driver. The immediate feedback to the driver is given within seconds of an unsafe driving act through visual/audio feedback. (Geller, 90) This behavior based system which gives immediate feedback to the driver was evaluated as being the best change solution for Premier Beverage Company LLC. (Geller, 129)

For most adult drivers, safe driving is not a skill-set issue. Safe driving is a mindset issue which is affected by negative behavior modifiers. Examples are drivers in a hurry to get from points A to B, those having a bad day at work, arguing with spouse or children, and/or learned bad habits that have become reinforced by not having a previous crash. (Kidd & Horrey 45). Companies use positive behavior modifiers with ride-a-longs, however, when the observer is not watching, the driver may revert to his previous unsafe behaviors. The chosen telematics company provides a new constant modifier with ongoing reinforcement through in-vehicle feedback (see Fig 1).

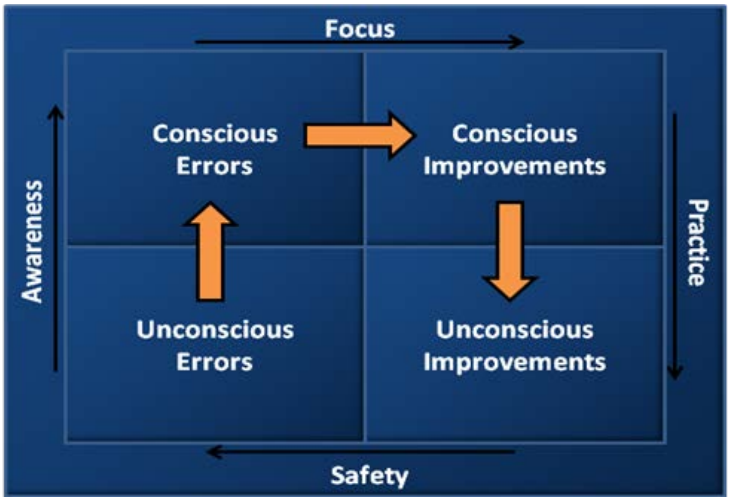

Figure 1.

An installed telematics system helps to eliminate the root cause of poor driving performance through the accommodation of various means of coaching and communication. The traditional coaching model is to react after the unsafe act has occurred. This practice of addressing these unsafe acts is reactive rather than proactive, and does not solve the problem. (Van Dyne 2011) The better approach is to be proactive. By using an immediate feedback solution, the drivers are enabled to make change without extra management follow-up. In-vehicle light emitting diodes (LED) light up to give immediate feedback to the drivers, which allows drivers to self-correct without management intervention. The immediate feedback events are assigned one of three colors which represent the driver's level of safe or risky driving: red for high risk, yellow for moderate risk, and green for safe. (Mckillips & Moser 2006) Only the red and yellow maneuvers are recorded.

The sensors in the telematics system monitor 120 event types across five categories:

- braking
- speed
- cornering
- lane handling
- accelerating

Sensors also monitor the drivers' idle time.(Ross,38) (Moser 2010) The content is generated, and data is transmitted by cellular technology to a server where the information is stored and manipulated by the telematics company for alerts, analysis, reporting, and coaching. This provides the drivers an opportunity to self-correct in the moment, without management intervention. (Geller, 21, 31, 254)

Once the data is collected from each truck concerning individual drivers, the management dashboard organizes the data for post trip analysis and reporting, and for ease of access by both the driver and manager (Phillips, J. & Phillips, P., 2011). This will help drivers to self-assess, and help managers to assess risk across the fleet. Some drivers respond better to after-the-fact feedback, which allows them to have time to digest the information, and reflect on safer driving practices (Furnell 2012). Managers can see the overall assessment of risk throughout the entire fleet, to become efficient and take action where appropriate. (Pollock 2005)

Managers and drivers have online access to the self-help portal. Drivers can pursue additional training at their own pace on this internet portal as well. Different drivers respond to different types of learning, so the internet portal offers a comprehensive program to appeal to the entire driving fleet (Furnell 2012). The program lends itself to incentive programs to create a competitive atmosphere and further promote safe-driving behaviors. These communications could include:

- Weekly email sent to drivers
- Website for drivers to log in and review their score
- Posting of all drivers' weekly scores in break room
- Letters of recognition sent to drivers

- Prize giveaways (i.e. gift cards to restaurants, hardware store, etc.) for safe drivers).

This program can create a friendly competitive atmosphere because each driver is in charge of his own driving behavior (Schulz 3A).

Summary

In 2009 the Premier safety manager and parent company CSG's risk manager determined, through their analysis of the previous years' crash incidents, that a new solution was necessary to reduce losses and operating costs without effecting Premier's ROI. After reviewing numerous and varied technologies, the choice of a telematics company met all their criteria and became the obvious answer to enhance Premier's existing fleet safety program.

Before completely committing to a change in technology, a short-term pilot program was utilized as a six-month trial for a portion of the fleet. This encompassed 57 trucks and 48 cargo vans.

Initial data was gathered from all the drivers, managers, and vehicles to build a data base specific to Premier. The data would be used to populate the management and driver reports, whereby the telematics company could assign each driver and manager an ID login number and a password. The ID number and password would allow access to the telematics internet information portal. The data collected for the trucks and vans is used to identify the vehicles, and help the programmers load the proper G-force parameters into the system which will give relevant feedback as relayed to the LED lights in the cab of the truck or van.

The telematics company handled all installation of the hardware. They also provided invaluable help through on-site visits by their program experts for pre-implementation meetings, responsibility assignments coaching, timeline for upcoming informational meetings, company memos, and posters. Post-installation, the telematics company provided weekly updates and coaching calls, and administered webinars as needed for ongoing training for managers in the use of the manager's portal and dashboard. (Geller, 217,223)

The telematics system was activated in August 2010 for the van fleet, and November 2010 for the truck fleet. In January 2011 Premier held an all-division meeting for the distribution and sales departments; also attending were Premier's insurance partners, corporate risk manger, telematics personnel, and senior management. During part of the two-day meeting, those managers who had not yet seen how the LED lights operate were required to drive a van to gain firsthand experience, and to understand the g-forces that were needed for the lights to move from green to yellow, and green to red. Premier's president participated in all aspects of the meeting, and personally congratulated those consistently safest "green light" drivers.(The Hartford 2011) Recognition was also given to those drivers' managers. Pictures were taken of the top performing drivers and drivers' mangers which were mounted on a 3 foot by 10 foot poster and hung in the drivers' area to celebrate their accomplishments.

After one year on the program the data was compiled, analyzed, and compared to the initial data gathered before the start of the telematics implementation by the Premier safety manager, corporate risk manager, insurance company partners, and the telematics company.

From October 2010 through October 2011:

- The number of claims decreased by 31%.
- The cost of claims decreased .74%
- A reduction in risky driving behavior was reduced by 75%.
- The increase in miles per gallon was 3.4 to 6.8 %.

A simple cost benefit analysis for one year of activity from October 2010 through October 2011 resulted in:

Claim costs = $214K+
Fuel savings = $17K+
Cost of Program = $54K-
Total Savings = +$177K

The program was deemed a success by Premier and all stakeholders. Premier can take pride in this achievement. By holding the drivers accountable through a behavior based telematics program, positive changes are achieved at a more rapid rate, and these results are more sustainable. Premier's safety culture has transformed into one which not only promotes more responsible driving, but has achieved that goal.

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