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Telematics-Driven Transformation: **Part 2**

Use Cases for Driving Value from ELD Mandates

By Bill McBeath | June 2019

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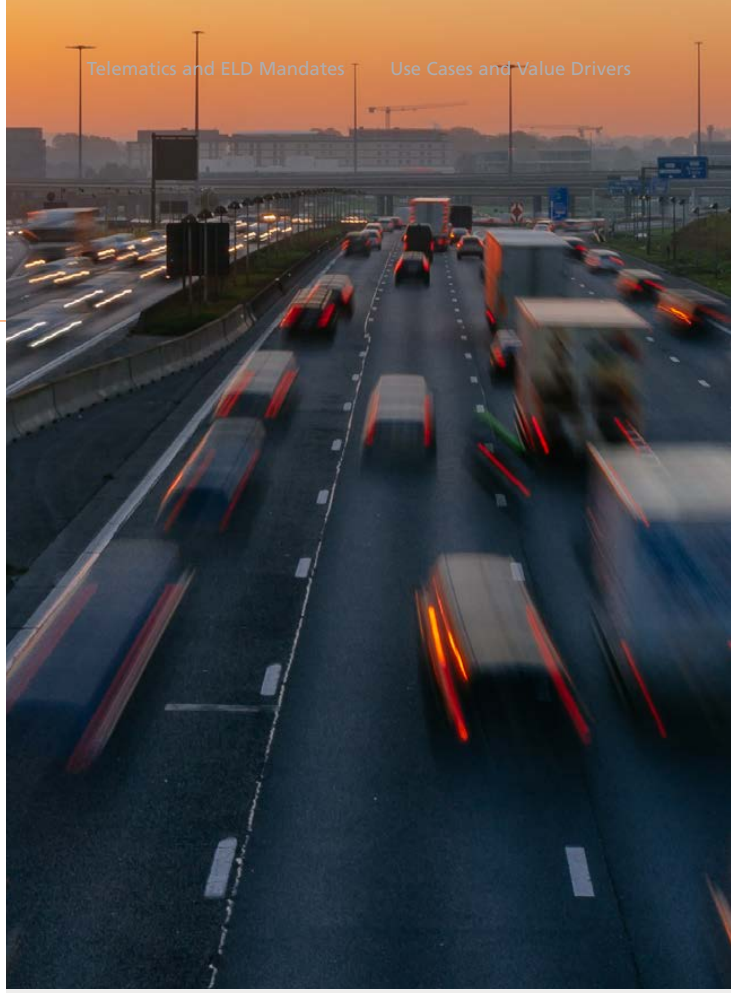


This is the second in a three-part series on the use of telematics to transform performance in carriers and fleet owning organizations.

In Part One, we looked at the mandates and best practices for dealing with them. Here in Part Two, we explore what value-add use cases we are seeing adopted, and what to look for in a system. Part Three discusses the characteristics to look for in an ELD solution.

Telematics and ELD Mandates

Telematics has become increasingly important due to federally-mandated adoption of ELDs (Electronic Logging Devices) by US motor carriers and drivers, and soon by Canadian carriers as well. Carriers and fleet owners are figuring out how to leverage their investment in these devices to create considerable new value, once these systems are in place. There are many high-value use cases being implemented. Here we discuss some of the most common ones being implemented across the industry.

What Are ELDs and HOS?

An Electronic Logging Device (ELD) connects to a commercial motor vehicle to record the hours driven by each driver, to ensure compliance with Hours of Service (HOS) regulations. HOS regulations limit the number of hours per day and per week a driver can drive and defines the minimum breaks and hours of rest between shifts. The main purpose of HOS is to reduce the number of accidents caused by driver fatigue.

Use Cases and Value Drivers

Fuel Economy

Fuel is the single largest operating cost for most carriers (even eclipsing driver pay), often accounting for more than a third of the total annual operating costs of each vehicle. There are several ways ELDs can help reduce fuel consumption:

- Discover drivers with excessive acceleration and speeding. Correct that behavior with training.
- Identify excessive/unnecessary idling and retrain drivers to reduce it, possibly with financial incentives. Consider installing heating and cooling systems that work independently of the engine, so drivers can remain comfortable in the cab, without idling the engine, in hot and cold weather. Consider providing auxiliary power, independent of the engine, to provide drivers with power for their devices while the vehicle is parked.
- Identify and fix vehicles that are getting poor mileage due to engine or other vehicle issues.

Taken together, the savings from these efforts can be significant. Some research has shown that improving driving behavior can reduce fuel costs (for that driver) by as much as 37%.[1] Overall fuel reduction from telematics-driven efforts can be up to 25%.[2] This can equate to thousands of dollars per year for class 8 long haul vehicles and many hundreds of dollars per year for medium and light-duty short haul vehicles. It can also be a significant tool to help companies meet carbon footprint reduction goals.

Fuel Economy

Hard acceleration
monitor and correct

Excessive idling
monitor and reduce

Engine performance
monitor and improve

Typical expected benefits

$390/year
Light Duty Truck
24K miles/yr

$650/year
Medium Duty Truck
24K miles/yr

$4,920/year
Heavy Duty Truck
80K miles/yr

Source: Geotab Paper, Increasing Profitability with Telematics

Safety, Security, and Driver Assistance

It goes without saying, accidents are costly, both in dollars and human lives and injury. According to OSHA's Guidelines for Employers to Reduce Motor Vehicle Crashes, "The average crash costs an employer $16,500 … an on-the-job crash that results in an injury, cost $74,000. Costs can exceed $500,000 when a fatality is involved." An ELD can be used to identify hard acceleration, hard braking, and speeding. If the ELD has an accelerometer, it can also identify aggressive cornering. That data can provide precise KPIs for each driver which can be used to identify drivers that need improvements. By making these KPIs available to each driver, they know exactly where they stand and how they can improve. Sometimes this is enough to improve the driver's behavior. Drivers needing further improvements can be coached and put on a program to improve their driving habits. In addition, real-time in-cab alerts can also inform the driver that they should slow down, stay in their lane, maintain safer distances from the vehicle ahead, warn of an imminent collision ahead, or otherwise modify their driving.

A good program can be used to turn an unsafe driver into a good one, which is usually much less expensive than trying to hire a new driver. According to Driver's Alert, a well-run telematics safety program can result in 45% fewer accidents, 75% reduction in speeding, 90% improvement in seat-belt usage, and 80% reduction in aggressive driving. In addition, insurance costs can be reduced by 5% to 25% by such a program,[3] with some sources reporting an average 10% reduction.

Geofencing and vehicle motion monitoring can provide alerting when a vehicle is stopped where it shouldn't be or deviates from the planned route. The dispatcher or network center operator can contact the driver to find out if they need help. This alerting capability can help detect and respond to thefts in progress, mechanical issues and breakdowns, or accidents where the driver needs help. The dispatcher has all of the necessary information, including exact location, and can share it with law enforcement, roadside repair services, or towing companies as needed. With these capabilities in place, some thefts can be *averted* and the goods recovered. Trucks can be repaired and put back into service sooner. Drivers and accident victims can receive the help they need more quickly.

Safety and Security

Unsafe driving behaviors
monitor and correct

Cargo theft
detect and respond

Breakdowns and accidents
detect and respond

Typical expected benefits

45%
fewer accidents

80%
reduction in aggressive driving

Reduced
cargo theft

75%
reduction in speeding

10%
reduction in insurance premiums

Rapid
roadside repairs and accident response

Vehicle Maintenance

According to the OECD, telematics programs can reduce maintenance and repair costs by up to 14%.[4] This is achieved through improved driving habits and predictive maintenance programs. As described in Safety, Security, and Driver Assistance above, ELDs can help reduce aggressive driving behaviors. This not only reduces *accidents*, it also reduces wear and tear on vehicles.

In addition, ELDs enable predictive maintenance programs. This is predicated on specific ELD's ability to work with a wide variety of engines and diagnostic codes, which varies from one ELD provider to another. The SAE maintains a list of over 700 different generic diagnostic codes. In addition, many manufacturers' engines generate their own proprietary codes. If the ELD understands and translates most manufacturers' proprietary codes into a uniform canonical set of diagnostic codes, then an even richer set of information is available for analysis. Depending on the richness of codes and engine status data available, analytics, and even machine learning algorithms, can be run to predict failures before they happen. Maintenance programs can shift from a usage-based maintenance (e.g. based on number of miles driven) to condition-based maintenance (based on actual condition of the powertrain and other vehicle systems). According to a DOE survey, implementing a functional predictive maintenance program can reduce equipment breakdowns by 70%-75%, while simultaneously reducing maintenance costs.

Maintenance

Reducing wear and tear
monitor and correct driving behavior

Predictive maintenance
move from usage-based to condition-based maintenance

Typical expected benefits

Up to 14%
reduction in maintenance costs

Up to 75%
reduction in equipment breakdowns

Source: OECD and DoD reports

Customer Service/Customer Experience

Telematics can improve the customer experience with more precise visibility into order status and better intra-day rerouting, adjusting to changing circumstances, so that customers are less disrupted by your disruptions. For businesses that have a vision to run an autonomous supply chain, real-time visibility from their carriers is not a luxury, but a 'must have' (see *Digital Supply Chains, Autonomous Supply Chains* below, page 7).

Customer Experience

Track and trace
precise milestones

Dynamic ETA
precise ETA, early/late warnings

Dynamic Replanning
optimized adjustments throughout the day

Typical expected benefits

Reduced
disruptions for customers

Improved
customer satisfaction and NPI scores

Enables
customers' digital supply chain strategies

Visibility/Precise, Dynamic ETA

When a customer calls or checks online for the status of their order or service call, which is better: "*they're supposed to arrive today sometime*" or "*the truck is 57 miles from your facility and with current traffic should arrive around 1:20*"? ELDs can provide customers and other stakeholders visibility into current location of shipments and a more precise, up-to-date ETA, especially when combined with other information such as traffic and impending events (e.g. a big ball game is about to let out). This helps the customer better plan their day.

Dispatching, Route Replanning, Driver Communications

When 'stuff happens' to disrupt the plan for the day, carriers and fleet owners have to respond and adjust. Without real-time visibility, the dispatcher resorts to trying to contact the various drivers to find out their status. With real-time visibility that ELDs provide, combined with data from other systems, dispatchers can have a map with a complete view of the current location and status of all currently available resources (drivers, vehicles, equipment, and supplies). Real-time visibility is a requirement for planning and routing engines to do intra-day rerouting well.

The visibility provided by ELDs can also help dispatchers in their communications with drivers throughout the day. They no longer have to bother drivers to find out their current status. In addition, they can be more proactive about spotting situations based on the driver's location and proactively alert the driver.

ELDs can be used to provide the following services to customers:

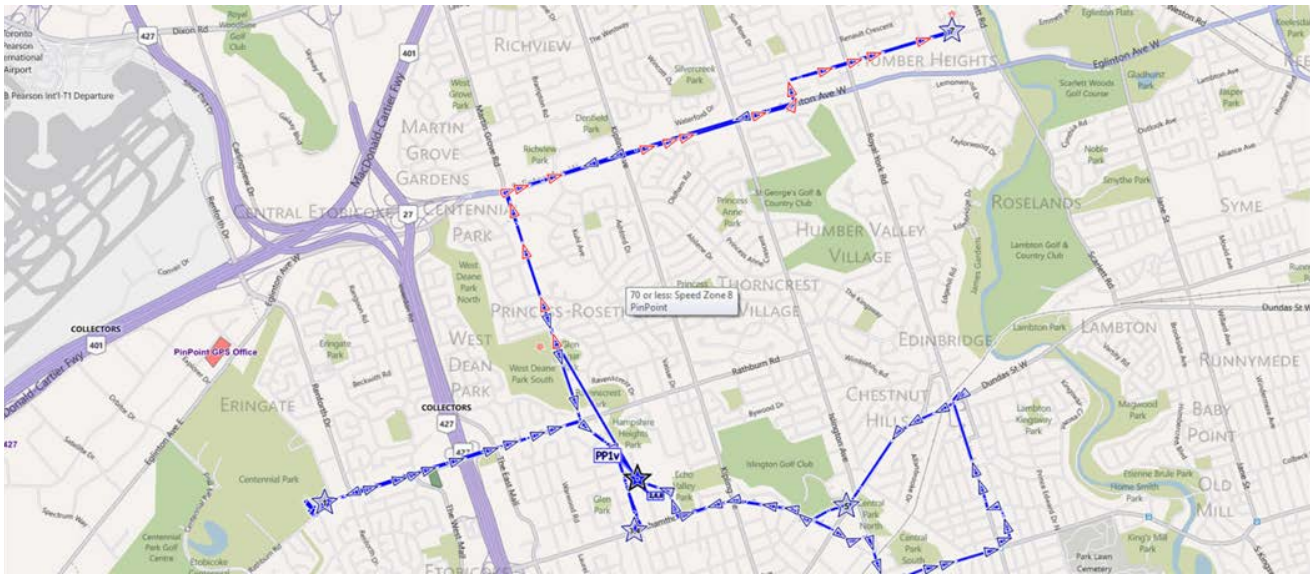
Track and Trace
Provide customers with milestones and updates on precise location of their order.

Destination alerts
Warnings when shipments are getting near the destination so the facility can prepare to receive, assign workers, make space, etc.

Early/Late alerts
Warnings when shipments are going to be early or late, so stakeholders and operations can adjust and mitigate consequences.

Dynamic delivery windows
Customers can be provided with increasingly more precise delivery windows, as the uncertainty diminishes.

Figure 1. ELDs Can Provide Continuous Realtime Visibility for Entire Fleet



Detention and Utilization

The inflexibility of ELD-monitored HOS compliance means excessive detention at facilities can cause significant consequences and pain for drivers and carriers. When dwell time exceeds what was planned, drivers may not be able to complete the planned journey without a long break. According a 2018 audit report from the DOT's Office of Inspector General, detention time reduces drivers' pay between $1.1B to $1.3B each year and costs carriers $250M to $302M annually. The report also concludes detention increases accident rates by 6.2% for each 15 minutes of additional delay.

The ELD mandate may exacerbate the consequences of delays, but ELDs can also be used to fix the problem. The data provided by the ELD platform can be shared with shippers and consignees to help them see the impact of their actions on performance and cost. Carrier-Shipper contracts should include detention pay provisions.[5] ELDs can help prove that drivers arrived on time and show exactly how long it took before they were able to leave. Shippers may still be reluctant to pay penalties, but at least the conversation can be based on objective machine-created data and the customer can be made more aware of the consequences of their actions.

ELD data can also help in other ways to increase driver and vehicle utilization. Route planners will have more precise information about actual times for different routes, times of days, and customers. They can plan more realistic and optimized plans. According to the April 2019 Cass Freight Index, "*ELDs (Electronic Logging Devices), which initially hurt the capacity/utilization of truckers (especially small truckers), are becoming an ever-smaller impediment to capacity utilization and in some cases actually improving utilization to levels above those achieved before ELD adoption. Many of the truckers who were the most adversely affected are now getting most, if not all, of the original loss in utilization back. This is especially true in the dry van and reefer (temperature control) marketplaces of trucking. Even the flatbed segment of trucking, which initially faced the greatest challenges with productivity after the adoption of ELDs, is learning to adapt.*"

Detention and Utilization

Reduced Detention
precise records of actual times, dialogs with shippers and consignees

Increased Utilization
better route and resource optimization

Typical expected benefits

Collaborative
reduction of detention/ dwell times

Increase
collection of detention fees

Increased
driver and vehicle utilization

ELD data can also help in other ways to increase driver and vehicle utilization. Route planners will have more precise information about actual times for different routes, times of days, and customers.

Dispute Reduction and Resolution

ELDs can be used to reduce and/or quickly resolve disputes. They can contribute to an electronic proof-of-delivery (PoD) by including the ELD data showing that the vehicle was at the customer's property at a specific time and day. The PoD could also include geotagged pictures of the delivery at the customer's site, and if possible, a signature from the receiving person. Together these provide very convincing proof that the items were delivered in good condition. Looking to the future, as businesses start to use smart contracts,[6] ELDs may play a role as one of the inputs into the smart contract, providing evidence that a specific service was provided at a particular time and location.

As *mentioned* above, ELDs can also record the precise actual dwell time at a location. The data can be used to bill customers for excessive detention. The ELD-generated data can be used to reduce disputes about how long the driver was actually on the site.

ELDs can also help corroborate non-culpability for truck drivers when there is an accident. The data will show exactly what speed they were going, when they started braking, and location information. ELD data can also be used when there is damage to a customer's property, for example cracks in a driveway or collision with a structure. The ELD's GPS data may prove that the truck was never in the location that the damage occurred.

Disputes

ePoD
provide electronic Proof-of-Delivery

Dwell time
accurately invoice excessive detention

Accidents
prove non-culpability

Typical expected benefits

Dramatic
reduction in disputes

Improved
relationship with customers, consignees

Increase
collection of excessive detention charges

Analytics

ELDs provide a wealth of data, including precise location histories, granular vehicle data, and potential IoT/sensor-based data as well. This is truly big data, as ELDs for a moderate-sized fleet can generate tens of millions of rows of data each year; far more than can be handled gracefully by spreadsheets. ELD solution providers may not provide all of the analytic tools needed either, so *third party* tools might be considered to do certain types of analytics.

The data generated by ELDs enable many different analytics, such as:

Benchmarking - improving fuel economy, safety, time-to-serve.

Geospatial intelligence - dangerous intersections, pothole detection, high-risk routes and times (reducing cargo theft).

Optimized route planning - time-of-day/day-of-week route optimization, accounting for HOS constraints.

Optimized DC dock scheduling - for private fleets, ELDs can reveal patterns that can be used to optimize dock scheduling, taking into account HOS constraints.

Fleet and driver utilization - uncovering opportunities to improve utilization.

Pricing and profit optimization - with visibility into the true cost of different lanes and shippers (using accurate transit and detention times), carriers can optimize their pricing to account for cost-to-serve.

Driver safety and performance - identifying best and worst driver behavior to reward and correct it.

Analytics

Optimized routes and DCs
accounting for HOS compliance

Price optimization
maximizing profit, based on cost-to-serve

Driver, vehicle performance
monitor and improve

Typical expected benefits

10%+
reductions in operating costs

Improved
fuel economy, safety, performance

20%+
increased profitability

The range of analytics possible is only limited by imagination and resources. A rich set of pre-built analytics from the ELD solution provider, with easy customization, can go a long way. Otherwise carriers and fleet owners may need outside help to build out the analytics they are looking for (unless they already have data scientists on staff). Investments in analytics can be well worth it. They can bring substantial improvements to performance, utilization, safety, and profitability.

Digital Supply Chains, Autonomous Supply Chains

Companies are striving to make their supply chains digital. This means moving from manual processes (based on paper documents, email, fax, phone calls, and rekeying of data) to automated, instrumented, fully connected supply chain processes. An in-depth definition can be found in The Digital Supply Chain Imperative, which defines the characteristics of a fully digital supply chain as: zero data entry redundancy, instrumented supply chain (data about various events in the supply chain is automatically generated via barcode, RFID, GPS, IoT, etc.), management-by-exception, with intelligence fed by fine-grained data. Sophisticated shippers are determined to create digital supply chains and hence are demanding that carriers provide them with precise, real-time location information about each shipment. In some cases, it has become a requirement for any carrier the company uses.

Digital Supply Chains

Instrumented
ELD provides real-time precise data

Predictive
disruptions and late arrivals predicted

Automated
automated response

Typical expected benefits

Dramatic
reduction in errors, information latency

Earlier
and more effective response to disruptions

More resilient
and responsive supply chains

That requirement will only get increasingly wide-spread and stringent as these large manufacturers, wholesalers, and retailers strive to take the next steps, building out autonomous supply chains.[7] Getting to a fully autonomous supply chain is a goal that will take many years. But some very large shippers are making serious attempts to start that journey now and it is creating a hunger for accurate, granular, real-time location data. One major retailer we talked to has been trying to improve the ETA accuracy for end-to-end shipments and has been frustrated by the inaccuracy and incompleteness of the visibility data they are able to get from carriers. They have a strong and clear preference for carriers that can provide consistent, accurate, real-time location. While today it is primarily the visionary large companies that are doing this, the use of autonomous supply chains will widen and spread over the next several years. The demand for precise real-time data will only increase.

Most organizations begin their ELD initiatives focusing strictly on compliance with regulations. However, if they stop there, they are missing out on significant opportunities to realize additional value. Here we have discussed a number of uses cases that carriers and fleet owners can implement, leveraging their ELD investments for expanded benefits and returns. Companies would do well to create a prioritized roadmap of these use cases, to build an ever-expanding ROI from their ELD investments. In Part Three, we conclude this series by looking at the key characteristics to consider when evaluating ELD systems and solution providers.

Notes:

[1] According to the Telematics Wire article Telematics to save fuel costs, "*A road test performed by Edmunds.com determined that restrained driving behaviors achieve up to 37 % of fuel savings compared to hostile driving strategies and staying within the speed limit generates up to 14% of reduction in fuel consumption.*"

[2] Source: Driver's Alert—Attention Fleet Manager: Fleet Safety is Important Too!

[3] Source: Increasing Profitability With Telematics

[4] OECD Observer—Towards smarter supply chains

[5] Two hours of unpaid detention time followed by $50 per hour is common, though some suggest $75 per hour or more.

[6] A smart contract is a computer-enforced contract that is automatically triggered by a mutually agreed specified set of conditions, typically based on data generated by IoT devices, enterprise systems, and other sources.

[7] This is not about self-driving vehicles, but rather self-driving supply chain processes. The ultimate goal is full automation of supply chain and logistical planning, execution, and exception-handling. It is journey that will take decades to fully realize but is starting now.

About ChainLink Research

ChainLink Research, Inc. is a Supply Chain research organization dedicated to helping executives improve business performance and competitiveness through an under¬standing of real-world implications, obstacles and results for supply-chain policies, practices, processes, and technologies. The ChainLink 3Pe Model is the basis for our research; a unique, multidimensional framework for managing and improving the links between supply chain partners.

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