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Telematics-Driven Transformation: **Part 1**
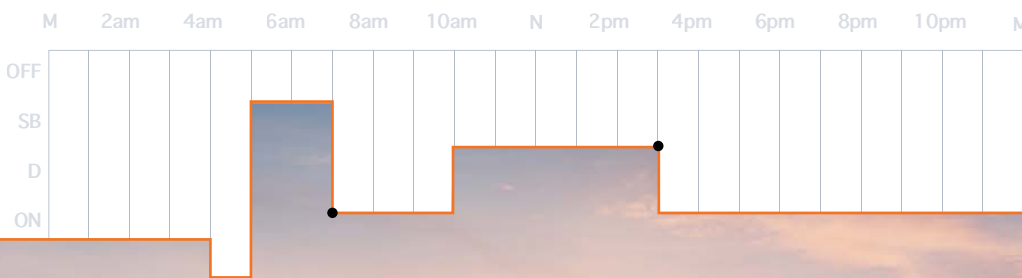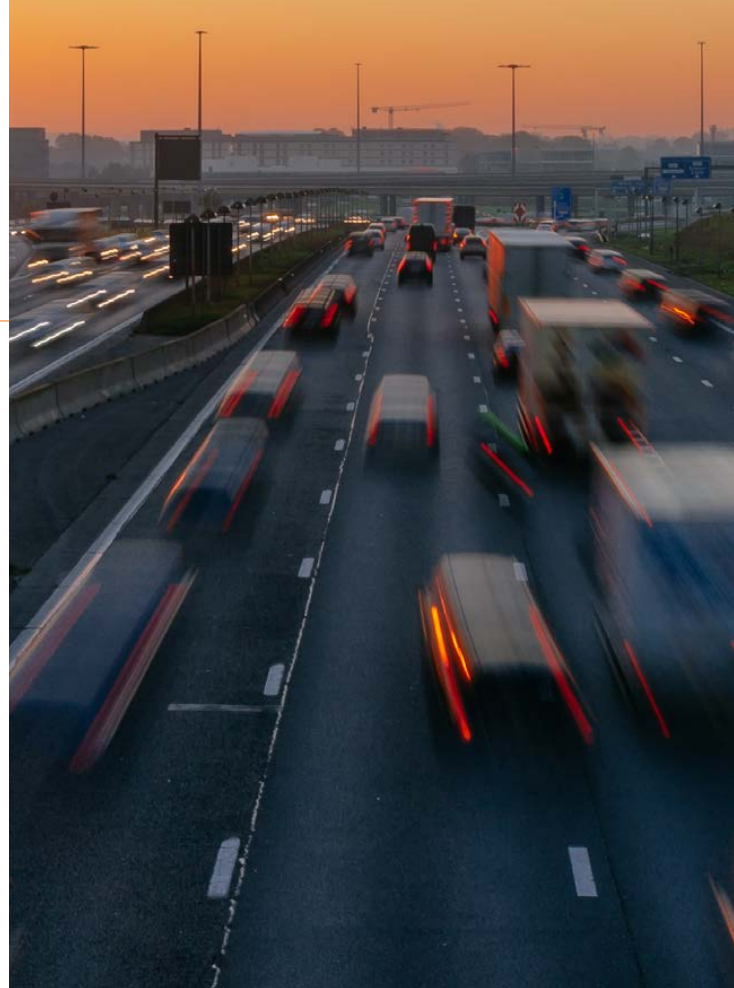
Best Practices
for ELD Mandates

By Bill McBeath | June 2019

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

Here in Part One, we look at the mandates and best practices for them. Part Two explores value-add use cases being adopted. Part Three discusses the characteristics to look for in an ELD solution. The research for this series included extensive interviews with experts in both Canada and the US.

Telematics and ELD Mandates — Beyond Compliance

Electronic Logging Devices (ELDs) have thrust telematics into the limelight due to federally-mandated adoption by US motor carriers and drivers, and soon by Canadian carriers as well. While owner-operators and many carriers, especially smaller ones, at first resisted implementation of mandated ELDs, smart 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.

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 define 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. ELDs replace paper logs (which were less reliable) and older electronic devices (AOBDRs/EOBRs)[1] previously used to record hours driven. ELDs use data from the vehicle's ECU (Engine Control Unit) via the OBD-II (onboard diagnostics) or similar interface, combined with GPS data to reliably record when the vehicle is in motion and ensure that all hours driven are accurately accounted for.

Regulations require that ELDs:

- Let drivers log in and set their status as on-duty, off-duty, sleeper berth, or on-duty not driving
- Display a graphical grid showing Record of Duty Status (RODs)[2]
- Provide RODs data to regulators and officers in a prescribed format

ELDs may provide other functionality above the minimum required by law. We further explore ELD functionality in part three of this series.

Figure 1. ELD Information Collected Throughout the Daily Driving Cycle; May Be Stored in a Cloud System
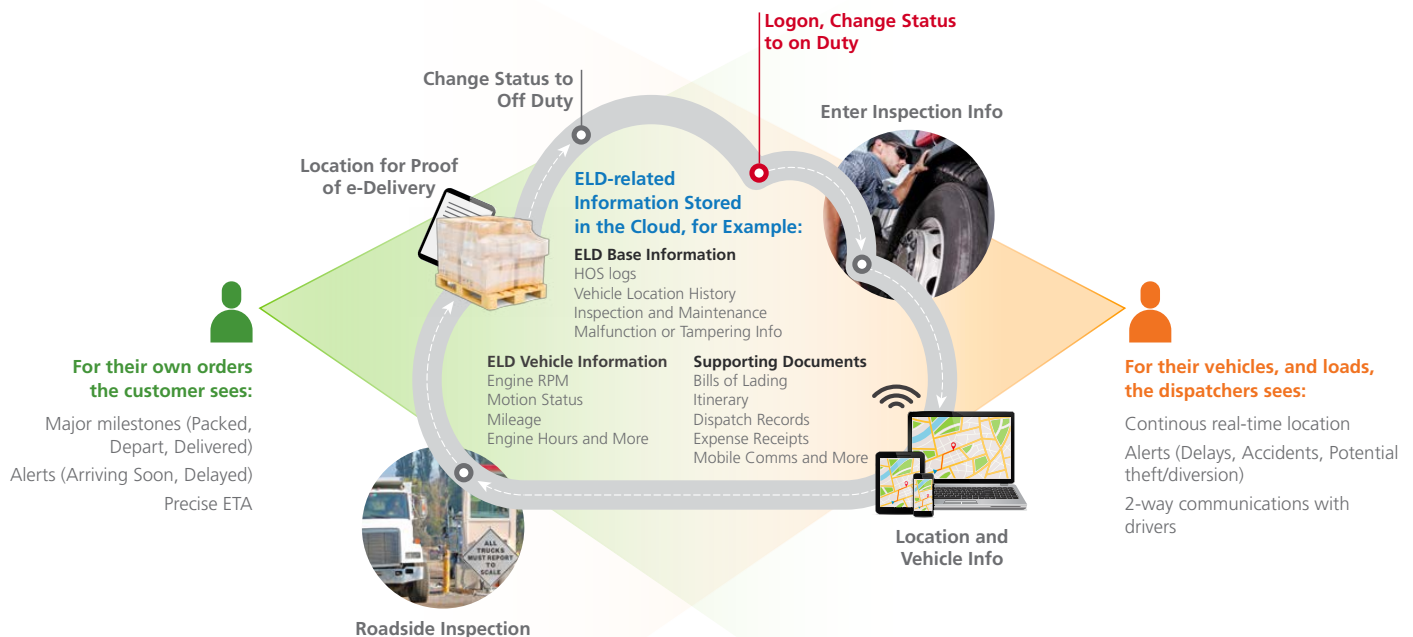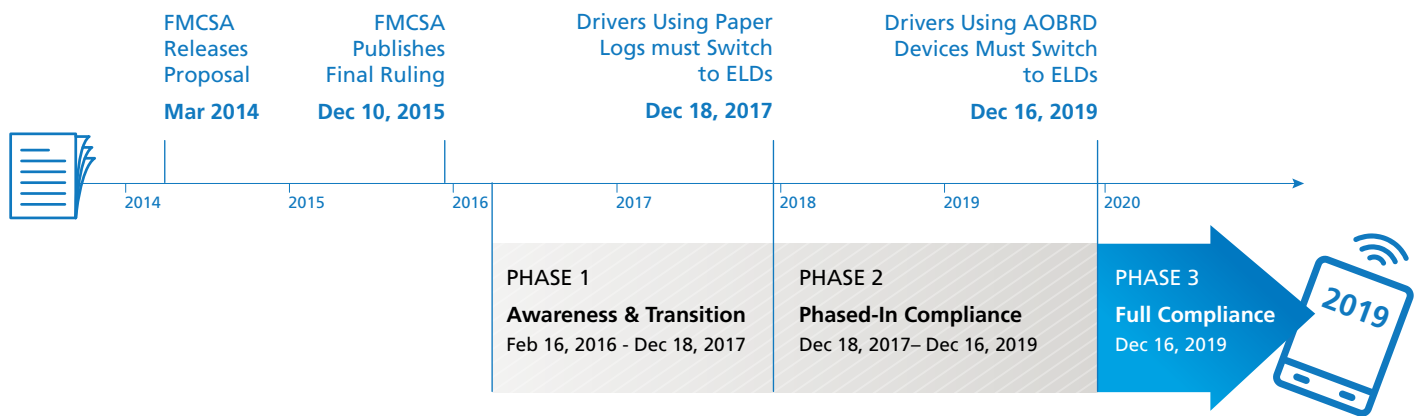
US ELD Mandate Already in Force

In the MAP-21 Act, the US Congress mandated adoption of ELDs (Electronic Logging Devices) with the aim of improving safety and recordkeeping efficiency. The idea is that, compared to the traditional paper logs (which can be easily falsified), electronic logging of the actual hours a truck is driven will improve compliance with HOS (hours of service) rules and reduce the ad¬min¬istrative burden of paper recordkeeping.

The Federal Motor Carrier Safety Administration (FMCSA) issued the ELD Final Rule[3] on December 16, 2015. It requires all Commercial Motor Vehicle[4] (CMV) carriers that operate across state lines to equip their vehicles with ELDs.[5] As of December 18, 2017, CMVs can no longer use paper logs or logging software, but must use an ELD (or an AOBRD installed prior to 12/18/17). As of December 18, 2019, all AOBRDs are no longer allowed; only ELDs can be used.

Figure 2. US ELD Rule Enforcement Timeline

FMCSA Releases Proposal	FMCSA Publishes Final Ruling	Drivers Using Paper Logs must Switch to ELDs	Drivers Using AOBRD Devices Must Switch to ELDs
Mar 2014	Dec 10, 2015	Dec 18, 2017	Dec 16, 2019

PHASE 1 — Awareness & Transition — Feb 16, 2016 - Dec 18, 2017

PHASE 2 — Phased-In Compliance — Dec 18, 2017– Dec 16, 2019

PHASE 3 — Full Compliance — Dec 16, 2019

Source: Geotab Paper, Understanding the FMCSA's Final Rule on ELDs

United States ELD Rule. The FMCSA's ELD Final Rule (49 CFR Parts 385, 386, 390, and 395) requires ELDs on all commercial motor vehicles. The rule specifies:

- The location of each vehicle must be recorded at least once an hour.

- Carriers must maintain RODs,[2] (Record of Duty Status), a recording of each driver's status for every 24-hour period with driver's name/ID, dates, locations, times, and driving status.

- ELDs must be able to transmit RODs data using either a telematics approach (web services or email) or a local approach (Bluetooth or USB) in a FMCSA-defined standard format.

- Carriers must retain, for six months, supporting documents containing information to verify the RODs, such as bill-of-ladings or other documents specifying origins and destinations, dispatch records, expense receipts, mobile communications (text, email, etc.), and payroll records.

- Carriers cannot pressure drivers to violate regulations.

- ELDs must be mutable when the driver is sleeping in the berth.

- If an ELD malfunctions, it must be repaired within eight days and drivers must immediately reconstruct on a paper log the last seven days of driving, unless that data can still be retrieved or was already sent.

- Drivers can make edits or annotations to records, but the original record must still be maintained.

- Manufacturers of ELDs must test and certify their devices against the FMCSA-defined standards.

Canadian ELD Mandate Enforcement Imminent

In December 2017, Transport Canada published the proposed ELD mandate, similar to the US rule. The enormous volume of cross-border trade between Canada and the US (almost $700B per year)—and the correspondingly large number of trucks operating in both countries—provides motivation to keep the Canadian requirements similar to the existing US regulations, so that cross-border carriers and fleet owners can more easily comply with both countries' regulations.

The final rule was published on June 13, 2019. The rule requires carriers to implement[6] ELDs by June 12, 2021. There is no additional transitional period for drivers and vehicles already using ERDs, as there was in the 2017 draft rule. Vehicles with existing AOBRD/ERD devices must meet the same 2021 deadline as those currently using paper logs.

Figure 3. Timing for the Canadian ELD Rule
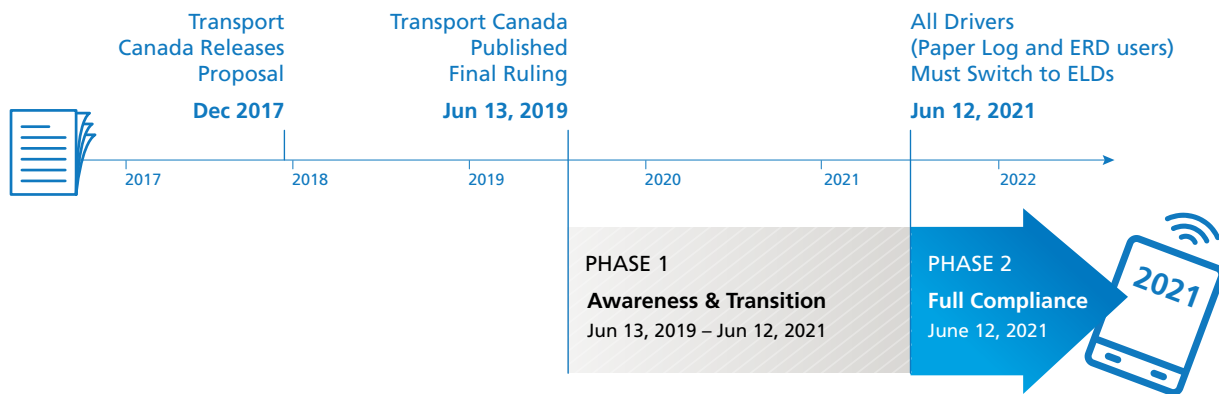
The Canadian rule has a number of similarities and differences from the US rule, as shown below:

Similarities

- Enforcement two years after publication of final rule.
- The ELD interfaces with the ECU/OBD-II port of the vehicle's engine.
- The ELD provides GPS tracking. Drivers login to the device and set/change their status.
- Devices automatically capture driving time, including when the vehicle is moving and the driver is not logged in.
- The ELD allows special driving statuses—Yard Move (YM) and Personal Conveyance (PC)—that are not counted toward hours of service.
- Drivers are able to check, edit, and annotate logs, but cannot delete the original log.
- An on-screen display presents information for roadside inspection by officers and regulators.
- Both ELDs can generate an output file for inspectors, but the formats are different.
- Pre-2000 vehicles are exempt.

Canada's Differences from US

- US enforcement started in 2017. Enforcement in Canada starts in 2021.
- Canada has no additional grandfather period, after the 2021 date, for preexisting devices.
- No central system for inspectors to use at roadside like the US's eRODS system. Each province will have their own inspection mechanism.
- Does not require capturing the VIN number.
- US ELD manufacturers self-register/certify. Canadian ELDs must be certified by independent testers.
- ELD must accurately track deferred Off-Duty time.
- ELD must allow entry of hours captured elsewhere (such as, driving done for another company).
- May email logs to an officer's email to view during an inspection (province-specific).
- ELD must allow drivers to switch between HOS rulesets (e.g. US vs. Canada, property-carrying vs. people-carrying, different cycles, time zones).
- Exemption for rental vehicles used less than 30 days.

Best Practices for Compliance and Beyond

Based on the experience to-date of US carriers and fleets, there are a number of best practices that can be applied to ensure a smoother transition, minimize disruption and capacity loss, and maximum benefits from ELD adoption. These can be grouped into:

1 Organizational Alignment

2 Value Realization

3 Driving Continuous Performance Improvements

1. Organizational Alignment

Establishing a Vision, Goals, and Strategy

It is vital that each carrier or private fleet company has a clear vision for its ELD program. A steering committee consisting of key stakeholders—fleet managers, operations, customer and driver representatives, and IT—should be formed to clearly define the goals, strategy, timeline, metrics/targets, and expected benefits for all stakeholders. While the initial goal may be compliance with regulations, the longer-term goals should include benefits and value beyond compliance (see below From Burden to Benefit, page 6). The vision, rational, timeline, and expected benefits for all stakeholders should be continuously shared and reinforced across the organization.

Policies and Procedures

Company policies and procedures need to be updated to include telematics and ELD compliance, such as the process for logging a driver's status, doing inspections, maintenance, and so forth. The policies should clearly indicate how the ELD data will be used and what it must not be used for. Harassment using ELD data is forbidden by law and anti-harassment policies should be clearly laid out. Policies requiring compliance and forbidding driving violations should be unambiguously spelled out, along with consequences for non-compliance.

Communication and Buy-In—Helping Drivers Through the Adjustment Period

Communication and buy-in across the organization are critical to the success of ELD implementation. Frontline workers can rebel and undermine an initiative if they feel threatened or don't understand it. In the case of ELDs, it is natural for drivers to be wary about 'big brother' tactics if they don't understand how the system and the data it collects will be used. Nobody likes to be put under a microscope. Furthermore, the ELD takes away the inherent flexibility of the prior paper-based system, which let the driver 'stretch the rules' a bit, such as when there was excess detention, to finish the job and get home.[7] That is no longer possible with the ELD recording every minute with precision.

Therefore, it is essential to have a plan on dealing with this new reality. It is important to let drivers know that you have their back. The anti-harassment policy should be clearly communicated to drivers, along with a confidential whistle-blower mechanism to use if the policy is not being followed by management. A system should be put in place to ensure that drivers always have somewhere to stop, instead of being stranded. Show drivers that you are working with shippers and consignees on reducing detention. Adjust route planning to account for stricter rules enforcement. Communications and dialog with drivers and operations should begin well before implementation and continue, often, to keep reminding drivers and others of the goals and benefits of the program. Providing a mechanism for drivers to express their concerns and grievances privately can help in identifying where some extra care (and possibly adjustments) are needed.

Training

Training of drivers, administrators, and managers is essential and should begin early in the implementation. Drivers should be trained on the goals of the program, the importance of compliance and consequences of non-compliance (for the company and individual), how to prevent violations, how the data will be used (and not used against them), how to use the device and the driver's app, and procedures for tracking and editing HOS. Drivers need to understand the policies and procedures. They should be strongly encouraged to not try to deal with HOS limitations by trying to 'beat the clock' with speeding or reckless driving.

Route planners and dispatchers should be shown how to create HOS-compliant routes, accounting for potential delays. Managers should be trained on how to use the system, dashboards, KPIs, and notifications. Critically, anti-harassment policies need to be clearly communicated and understood.

Incentives

Clear compliance metrics should be set, such as for clean inspection rates and violation rates. When the organization is ready to try for additional performance improvements, then value-add goals can be put in place, for example reduced fuel consumption, reduced accident rates, or increased fleet utilization. Drivers and managers can be recognized and rewarded for meeting or exceeding goals. When individuals or units fall short of goals, the root causes should be diagnosed and jointly resolved with the team. Some carriers and fleets have switched from paying drivers by the mile to paying by the hour to incentivize safety first.

It is important to let drivers know that you have their back. The anti-harassment policy should be clearly communicated to drivers, along with a confidential whistle-blower mechanism to use if the policy is not being followed by management.

Start Implementation Sooner Rather Than Later

All of this takes time, starting with organizing the steering committee, setting vision and goals, setting up training programs, evaluating and selecting devices, apps, and software, acquiring, implementing and testing. Organizations that wait until just before the deadline will have to skimp on all of these and will pay the price. Furthermore, the benefits that can be had from value realization can measurably outweigh the cost of the program. It makes sense to realize these benefits sooner rather than later.

2. Value Realization

Carriers and fleet owners that implement ELD merely to comply are missing significant value generation opportunities. The ELD steering committee should be tasked with seeking ways to generate value from the ELD investment and creating a prioritized roadmap for implementing those plans. The first step in the roadmap will likely be basic implementation for compliance purposes. After that can be operational improvements and transforming the customer's experience. New use cases,

along with the expected benefits and performance targets, should be explored and defined. Examples of potential use cases and sources of additional value are detailed in part two of this series.

3. Driving Continuous Performance Improvements

Defining and Monitoring KPIs

Each phase of the program should have a clear set of goals and KPIs for measuring success. To enable monitoring of progress, strong dashboard, alerting, and analytics capabilities should be considered during the evaluation and selection of ELD devices and software. Dashboards can help managers and individuals monitor progress towards goals and identify areas that need more work. These might include things like fuel consumption, safe driving behaviors, HOS compliance, fleet utilization, maintenance costs, and more. ELD data can also be used to improve customer behaviors. ELDs can provide precise data about detention times, which can be used to work with customers to reduce excessive dwell times at customer facilities.
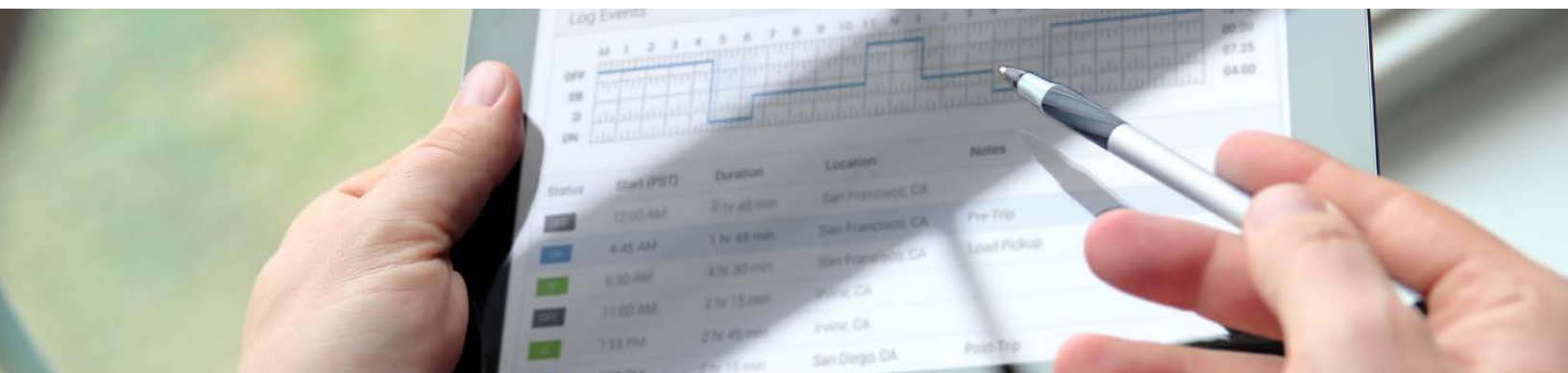
From Burden to Benefit

When ELD is implemented purely to comply with regulations, and no efforts are made to realize additional benefits and value, then it can be a burden on carriers. Beyond the cost of the devices and ongoing subscription costs, the ELD mandate effectively reduces capacity and lengthens transit times for those carriers who previously 'got away with' non-compliance under the old paper-based system. The tightened capacity has exacerbated the driver shortage, resulting in higher wage rates, though not necessarily higher total wages for individual drivers.[8]

However, carriers and operators have an opportunity to claw back significant value from their ELD investment, for a substantial positive ROI. There are many different use cases for driving value to carriers, fleet owners, drivers, and their customers. In part two of this series, we explore in depth some of the key use cases for driving value.

Getting Value Now and in the Future

Those who view the ELD mandate strictly as a burden without an upside, often delay implementation as long as possible, and invest the least amount possible. That is shortsighted, as there is potential for a very respectable ROI by making the right investments. You don't necessarily have to pay a lot for the device itself, but it pays to invest the time to create a vision of where you want to go and then do the homework to select the best solution provider to help take you on that journey.

Those who have already bought an ELD device (that is most US carriers and fleets), can build on their investment now, by expanding the services and value they are getting out of the system. Here are some actions to generate value from your ELD investments, now and in the future:

Create a cross-functional steering committee … and bold vision!

If you don't already have a cross-functional group to create a vision and roadmap, now is the time. The value-add uses, where the real ROI is generated, requires a bold vision, support from the top, and cooperation across the enterprise.

Driver outreach

It is critical to get buy-in from drivers and avoid a rebellion. Have healthy driver participation on the steering committee, communicate often, listen to and address concerns. Change takes effort for all, but that effort is worth it.

Find and partner with the best solution provider

There are many providers of ELDs and related software, but they are not all created equal. Take the time to find the right solution provider who you can partner with to help you go the distance. In part three of this series, we outline key characteristics to look for when selecting a solution provider.

Don't delay

In particular, Canadian carriers should not wait until the last minute. The sooner you start, the more time you will have to create the steering committee, agree on vision and goals, set up training programs, evaluate and select solutions, acquire, implement, and test. By allowing enough time, the transition will be smoother, and you can start learning, improving and extracting benefits from your investment.

The same urgency applies to US carriers who are still using AOBRDs. The December 2019 deadline is looming. Waiting until the last minute is a recipe for headaches—not having enough time to select the right system or resolve all the inevitable transitional issues that arise, potentially resulting in costly non-compliance.

Appendix A: Impact of the ELD Rule on Companies and Industry

Impact of the ELD Rule on Individual Companies and Drivers

Consequences of non-compliance

Drivers without an FMCSA-compliant certified ELD device are placed out of service for up to 10 hours. After that, they may be allowed to finish their current delivery, but cannot be dispatched again until they install a certified ELD device. The average failure to comply fine has been $2,867 per offense.[9] On top of that are the loss of revenue and towing fees. If investigators determine there is a pattern of non-compliance for a fleet, fines may be assessed on every truck in the fleet.

Impact on CSA SMS scores

ELD violations can have a significant negative impact on the CSA score. There are 22 ELD violations[10] that impact the CSA score. Furthermore, ELDs can be used to monitor and improve driving habits, reducing the chances of speeding tickets and other moving violations that can have a large negative impact on the CSA score. Shippers and brokers often take into account a carrier's CSA SMS score,[12] as a measure of the carrier's safety record, when selecting a carrier for hire. Thus, carriers are incented to maintain a good score, not just because of potential fines, but also because of the potential for loss or gain of business. Furthermore, CSA scores impact the associated ISS (Inspection Selection System) score. A better ISS score increases the chances for a bypass at a weigh station, saving the carrier time and money.

Insurance premiums

The CSA score (and thereby ELD violations) also impacts insurance rates. A higher CSA score (i.e. more violations) can lead to higher premiums, and in some cases even denial of coverage. Conversely, a low CSA score can bring lower insurance rates. In addition, some insurers are offering discounts on premiums for qualifying truckers who voluntarily share their ELD data. These discounts can be significant for drivers/fleets whose ELD data shows they drive more safely than their peers.

Significant carrier/fleet performance improvement opportunities ELD devices, combined with the right software and process changes, has the potential to help carriers reduce fuel consumption, decrease maintenance costs and breakdowns, improve driver safety, decrease cargo theft, improve fleet utilization, decrease dwell times, and provide much better visibility to customers and all stakeholders. We discuss these in more detail in part two of this series.

Reduced paperwork for drivers

Estimates of reductions in administrative work from the adoption of ELD vary from 15 to 45 minutes per day, per driver. At a pay of $20/hour and savings of 30 minutes per day, that equates to about $2,000 to $2,500/year[13] of increased productivity per driver.

Broader Impact of the ELD Rule

HOS compliance improved

According to a study by three universities,[14] HOS compliance has improved since the mandate. The number of intentional HOS violations dropped from 6.0% to 2.9%. For owner-operators, HOS violations dropped from 10.7% to 6.0% percent during strict enforcement. Large carriers' violation rates were already under 1%.

Accident rates virtually unchanged

Weekly crash rates changed from 1,717 crashes per week before the mandate to 1,703 after, about a 1% reduction.[15] However, owner-operators committed 35.3% more unsafe driving violations after the rule went into effect.[16] Without that increase in unsafe driving, there may have been a greater reduction in crashes.

Transit times increased, effective capacity reduced, rates up

With stricter compliance to HOS rules, transit times increased, particularly on 450-550 mile lanes, where transit times increased by about 16%.[17] Many of these have gone from being one-day routes to becoming two-day routes.[18] Overall loss of 'market hours' was about 3%.[19] The demand for truck capacity exceeded the supply, driving up rates significantly (though the imbalance and rate increases were not due solely to the ELD mandate).[20] The increased rates helped carriers absorb some of the reduction in capacity and the cost of implementing ELD programs. Rate increases moderated in the second half of 2018.

Carriers and shippers/consignees start to collaborate

Stricter adherence to HOS (driven by ELD adoption) combined with tighter capacity has provided some impetus for shippers and consignees to better understand the impact their operations have on carriers' performance and HOS compliance. When tight capacity forces carriers to make decisions on who to serve first, shippers are motivated to try and become the 'shipper of choice.' While that balance of power will shift as demand and supply fluctuate, ELDs will continue to provide precise data about detention and turnaround times at different consignees' facilities. Those metrics can inform dialogs between the parties on how to decrease dwell times, for the benefit of all.

Notes:

1 AOBDRs (Automatic On Board Recording Device) and EOBRs (Electronic On Board Recording) refer to older recording devices that predate the ELD mandates and specifications. These are compliant in the US until December 16, 2019.

2 RODs (Record of Duty Status) are a recording of each drivers' status accounting for 24 hours each day. Status may be on-duty, off-duty, sleeper berth, or on-duty not driving. For more details, see pages 18-20 of the Interstate Truck Driver's Guide to Hours of Service.

3 The full text of the ELD Final Rule can be found here.

4 The FMCSA defines a commercial motor vehicle as any vehicle with a gross vehicle (or combination) weight rating greater than 10,000 lbs., or designed to transport 9 to 15 passengers for compensation, or any vehicle designed to transport over 16 passengers; or any size vehicle used to transport hazardous materials.

5 There are exemptions for vehicles older than model year 2000, driveaway-towaway operations, and drivers who maintain duty status logs for eight or less days during any 30-day period.

6 This includes selecting, acquiring, and installing the ELDs, as well as testing and training drivers on using them.

7 Note, there are ongoing discussions about modifying the regulations to provide some flexibility in meeting HOS requirements. The current US administration appears to be receptive to those kinds of modifications.

8 Drivers paid by the mile, who 'stretched' the HOS limits using the paper logs before the ELD mandate, are now forced to strictly comply and thereby drive fewer hours and miles. Thereby, even with increased per-mile wages, their total pay may have shrunk. Drivers who were already strictly compliant with HOS rules, likely saw their paychecks increase in 2018.

9 Source: North American Transportation Association (NTA). Fines range from $1,000 to $10,000 or more per offense.

10 A spreadsheet listing all 22 violations and their severity impact on CSA score can be downloaded from the CSA site here.

11 CSA (Compliance, Safety, Accountability) is the FMCSA's data-driven safety compliance and enforcement program. One of its core components is the Safety Measurement System (SMS), which the FMCSA uses to measure the severity of safety issues, identify carriers with potential safety problems, and prioritize interventions required.

12 Progressive Insurance launched their 'Smart Haul ELD' program in 2018, offering usage-based insurance to owner-operators and small fleets. It includes a minimum 3% discount on their existing policy. Additional savings may be granted, based on how safe the fleets' driving is compared to truckers doing similar work.

13 The figure would be higher for the fully loaded labor cost or revenue contribution of the driver's time.

14 In this study, researchers from Northeastern U., U. of Arkansas, and Michigan State examined millions of driver inspections from January 2017 to September 2018 and looked at all the crashes submitted to the FMCSA during then.

15 A 2014 study by the Virginia Tech Transportation Institute evaluated data from carriers on 83,000 crashes and found that trucks equipped with ELD-like devices had 11.7% fewer crashes than those without the devices. This could be a correla¬tion of the policies and culture at companies who invested in these devices, rather than a result of the device itself.

16 One theory about why the increase in unsafe driving occurred is that, since owner-operators were less compliant with HOS regulations before the ELD mandate, they also experienced the biggest impact on their capacity due to the ELD mandate pushing them to better comply with HOS regulations. Thereby, some owner-operators may have tried to partially compensate for this loss of capacity by speeding and driving more aggressively. We would not expect a big change in accident rates for larger carriers when the ELD mandates took effect, since they were already largely compliant with HOS regulations. It should be noted that nationwide data analyzed by Vigillo found that speeding violations for the industry overall went down dramatically upon implementation of ELDs.

17 According to a survey by Zipline Logistics. They also found transit times on 750 to 1,000-mile lanes increased 10%.

18 Stricter HOS compliance means drivers can no longer complete these routes in one day. Carriers have changed their rates for these routes accordingly.

19 Source: C.H. Robinson Worldwide, Analyzing the Impact of the ELD Mandate on Truckload Shipping.

20 In 2018, dry van and reefer spot rates were up 30%, flatbed spot rates increased 25%, while contract rates increased more than 15%. The supply-demand imbalance and rate increases cannot be attributed to the ELD mandate alone. The economy, driver shortages, and other factors play major roles. Analysts predicted the market will soften in 2019.

About ChainLink Research

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