Making Sense of the ELD Rule & Fleet Taxonomy

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James Brehm & Associates Joins CABA Board of Directors

James Brehm & Associates (JBA) has recently joined the Continental Automated Buildings Association (CABA) Board of Directors; CABA is a nonprofit industry association that provides information, education, and networking to help promote advanced technologies for the automation of home and buildings. With +20 years of experience in telecommunications and business services, Vice President of Business Intelligence and Analytics of JBA, Keith Tamboer, will act as the company representative on the CABA board.

JBA’s involvement with CABA is a natural one. James Brehm has been a member of CABA for over 4 years and believes that connected homes and buildings are among the “fastest-growing segments in IoT.” Ronald J. Zimmer, CABA President & CEO, has stated that they are happy to add to their board of directors, James Brehm & Associates--”a firm that has empowered industry in its transformational journey, assisting businesses to be more responsive and agile while investing in their digital futures.”

Tamboer added that he is “very pleased” to support CABA in its efforts to promote the automated technology ecosystem. “We look forward to collaborating with CABA’s industry councils and participating in research initiatives that inform the market about IoT’s transformational impact on homes and buildings.”
Fun Facts

Some Fun Facts to Make Your Day

• The Rhode Island State Police Dept. issued a record-breaking $57,000 fine to the crane rental and transportation solutions company, Bay Crane Inc. for attempting to haul an overweight truck (carrying a 560,524 lb-generator!) on June 27, 2017. The maximum allowable load weight is 80,000 lbs.


• The average price of diesel fuel has spiked and plummeted wildly in the past 18 years, hitting a low of 95.9 cents in February 1999 and soaring to $4.70/gal in July 2008. Most recently—as of July 2017—the average price has been $2.50/gallon.

(Source: https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMD_EPD2D_PTE_NUS_DPG&f=M)

• Dubbed “The Iron Knight,” the world’s the fastest semi is a Volvo truck. Outfitted with a 13-L mid-mounted D13 engine that generates 2,400-horsepower and 4,425 lb-ft of torque, the semi, can go as fast as 171 mph.

(Source: https://www.autoblog.com/2016/08/24/volvo-semi-quickest-truck-in-the-world/)

• The Guinness World Record largest convoy of trucks consisted of 416 vehicles and was organized by VTL Group (an automotive & precision engineering company) in in Dronten, Netherlands on November 6, 2004.

(Source: http://www.guinnessworldrecords.com/world-records/largest-truck-convoy)

• The trucking industry is expected to grow by about 21% over the next ten years.

(Source: https://planetfreight.com/15-interesting-trucking-facts/)

• The average food item travels at least 1,500 miles before it gets to your plate.

(Source: https://planetfreight.com/10-interesting-trucking-and-logistics-facts/)
The ELD Rule Unraveled

By: James Brehm & Randy Field

Preamble

We’ve been receiving a lot of questions around the mandate for electronic logging devices (ELDs) in over the road vehicles, including:

- Will it happen? Or will there be a delay?
- Why is there a mandate?
- Are there any loopholes?
- How do we achieve compliance?
- Who are the best vendors and solution providers?
- How many people have deployed a solution and how many need to deploy?

Knowing this, we’ve put together a brief history as well as a summary of the mandate, some information on certified solutions, information on how many deployments, and what happens next.

Safety

The road can be a very dangerous place. From 2012 through 2015 (the last year that we have statistics for) there was an average of 3760 fatal crashes on US roadways which included heavy trucks and buses. And for years, we’ve wondered “can technology mitigate this problem?” Will ELDs solve the safety issue?

History of the ELD

Over the years, the FMCSA has drafted three generations of electronic hours-of-service (HOS) rules: AOBRD, EOBR and ELD.

AOBRD: The 49 CFR 395.15 Automated-On-Board-Recording-Device (AOBRD) rule dates back to 1988 and provides requirements for devices that can be used as an alternative to handwritten Record-of-Duty Status (RODS) paper forms. As defined in 49 CFR 395.2, an AOBRD is an electric, electronic, electromechanical, or mechanical device capable of recording a driver’s RODS information accurately and automatically as required by 395.15. The device must be “integrali-ly synchronized” with specific operations of the vehicle. At a minimum, the device must record engine use, road speed, miles driven and date/time of day.

EOBR: After issuance of the AOBRD rule, a new HOS bill, 49 CFR 395.16 FMCSA Electronic On-Board Recorder (EOBR) rule was proposed that required motor carriers with a 10 percent or greater violation rate (“threshold rate violation”) of any HOS regulation be subject to mandatory installation of EOBRs meeting the new performance standards included in the rule. The Agency estimated that the remedial directive aspect of 2010 rule would be applicable to about 2,800 motor carriers in the first year and 5,700 motor carriers each year thereafter.

In June 2010, the Owner-Operator Independent Drivers Association (OOIDA) filed a petition in the U.S. Court of Appeals for the Seventh Circuit seeking a review of the FMCSA EOBR rule. On August 26, 2011, the Seventh Circuit vacated the April 2010 rule leaving the AOBRD rule as the only enforceable HOS rule today.
ELD: In 2012, Congress enacted the “Moving Ahead for Progress in the 21st Century” bill that is more commonly referred to as “MAP-21.” The bill required that FMCSA issue a new ELD rule mandating HOS recording devices be used by most interstate carriers.

The final ELD rule draft was cleared by the White House’s Office of Management and Budget (OMB) on November 17, 2015. The final ELD rule was published in the Federal Register on December 16, 2015, starting the clock to December 2017 compliance for vehicles without existing devices and upgrading existing uncertified devices by December 19, 2019.

What benefits come with the use of ELDs?

While the use of ELDs is a mandated expense, there are numerous benefits to using electronic logs. If fleet owners and managers look closely, they’ll find that the return on investment of the use of ELDs may just exceed the costs of implementation and disruption of existing business processes.

First of all, electronic logs can greatly simplify compliance by eliminating the need for paper logs. Drivers and carriers see significant time savings from going paperless.

In 2015, the federal government reported that 5 of the top 10 driver violations cited in roadside inspections came from logging issues. This equates to tens of millions in fines and untold millions of dollars in lost windshield time. Through the use of ELDs, some of the most common logging violations can be eliminated. Virtually all “form and manner” log violations go away, drivers always know where they stand on compliance, and drivers always have a current log. Alerts will tell driver when they are approaching an HOS limit.

Besides making compliance easier, electronic logs make auditing easier and faster. The systems typically come with automated auditing built in. Roadside inspections can be completed easier and quicker.

Scheduling and dispatch become easier because office personnel know the location of the vehicles and how much time drivers have available. And depending on solution and platforms, real time data can be injected via API directly into back office applications.

Location, engine use, speed, and other data captured by devices can be used for the purposes of driver scoring and education, improving fleet safety while reducing fuel and equipment costs. It can also prove valuable during litigation or other legal proceedings, potentially protecting both the driver and company.
How many and who’s deployed?

So how many vehicles does this apply to? How many have deployed? We believe the rule applies to most of the 2.65 million interstate motor carriers and 230 thousand interstate commercial buses in operation. Also, a number of non-combination heavy trucks and vans that operate across state lines qualify. The chart below shows the current split of compliant vehicles and vehicles yet to deploy.

The ELD Basics

Today approximately 2.65 million interstate motor carriers, 230 thousand interstate commercial buses and several thousand box trucks are in operation and are currently required to prepare and retain paper Records-of-Duty-Status (RODS) that comply with HOS regulations under 49 CFR Part 395. The following drivers are excepted in Section 395.8 from installing/using ELDs and may continue to use “paper”:

- Drivers operating in a zone less-than 150 miles from end-to-end
- Drivers of vehicles manufactured before model year 2000
- Drivers who use paper RODS for not more than 8 days during any thirty-day period
- Drivers who conduct driveaway-towaway operations, where the vehicle being driven is the commodity being delivered.

Intrastate

Florida and Texas (two of the first to address the issue) share a set of in-state hours rules that include greater limits than the interstate rule, with 12 hours of total daily drive time, longer on-duty windows, and greater weekly cumulative limits.

Per the Bureau of Labor Statistics, Texas has the most heavy and tractor-trailer truck drivers with over 175,000 employed in the sector. And after passing in state legislation, Texas intrastate motor carriers are expected to have ELDs with the same specifications as the FMCSA compliant devices by December 19, 2019.

Florida House Bill 545 is moving through the Florida State House and Senate to adopt the ELD mandate. If the bill becomes law as currently drafted, it will go into effect on Dec. 31, 2018. Our belief is that other states will follow.

Delayed Again?

On July 18, 2017, a U.S. House of Representatives bill to delay ELD implementation for two years, H.R.3282, was introduced by Congressman Brian Babin, R-Texas. Apparently, procrastination has led to panic. By many estimates 2.5 million affected vehicles do not have ELDs installed. With four months left in the year, installation for this number of trucks is doubtful. The bill was referred to the House Appropriation’s Subcommittee on Transportation. With major issues such as the federal budget and health care on top of the upcoming recess, getting enough support to bring the bill to the floor before December will be difficult.
Noncompliant ELD fines can be as high as $11,000 per incident, and there are hidden violation costs including: temporary or permanent shutdown orders, violation points that can affect weigh station bypass permissions, increased insurance and lawsuits from those that are injured or families of those who have been killed. The FMCSA estimates that paperwork and crash reduction savings will be three times ELD cost.

By many estimates 2.5 million affected vehicles do not have ELDs installed.

**ELD Self-Certification**

ELD service providers must self-certify and register their ELD with the FMCSA. The self-certification and registration process involves getting a user account, registering the ELD and meeting the technical specifications of the ELD rule.

Currently, there are close to 70 FMCSA registered ELDs from 50 providers. Some major device manufacturers are choosing to partner with service companies. In doing so, the service company bears the burden of registering, testing and certifying the ELD.

Self-certification is complex. The ELD rule is over 500 pages long. The test plan and procedures document is over 400 pages long with eight categories: (1) Accounts, (2) Vehicle Interface, (3) ELD Inputs, (4) Processing, (5) Recording, (6) Monitoring, (7) ELD Outputs, and (8) Data Transfer. Functional requirements are listed in a detailed matrix such as the following for Vehicle Interface and ELD Inputs:

ELD‐FUNC‐4.3.2‐3: A stopped vehicle must maintain zero (0) miles per hour speed to be considered stationary for purposes of information entry into an ELD.

Self-certification is not for beginners.

By many estimates 2.5 million affected vehicles do not have ELDs installed.

**MAJOR PROVIDERS OF REGISTERED ELD SOLUTIONS**

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<tr>
<th>Company</th>
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(Source: Federal Motor Carrier Safety Administration)
The IoT and SAE-J2497 Conundrum

By definition, ELD wireless connectivity make it an Internet of Things (IoT) device. Networks and ecosystems built on the back of the ELD rule will grow. Regulatory mandates have always erased the cost barrier and been a catalyst for technology evolution.

Noncompliant ELD fines can be as high as $11,000 per incident.

The ELD rule is a solid step forward for HOS compliance. However, a piece of the end-to-end carrier ecosystem might have been left behind: trailers.

Tractors move trailers!

Trailers communicate with tractors in compliance with the SAE-J2497 Power-Line Carrier (PLC) Communication standard issued on October 31, 2002. Video is transmitted in the 20 MHz range over copper wire. Per SAE Publication 973174, The Use of Power Line Carrier (PLC) Communication System for Video and Data Distribution on Trucks, Trailers and Buses, some major limitations encountered in data communications system design over electrical (power) lines are noise, interference and dispersion of signal pulse.

The PLC standard outlines hardware and software requirements for areas such as interface requirements, system protocols, and message formats between tractors and trailers. PLC is a serial network carried over the trailer’s continuously hot SAE-J1939 connector center pin that was created for communication of the trailer’s Anti-Lock Braking System (ABS) status with a lamp in the tractor.

If new product developers are not careful, the lower power IoT wireless bandwidths and the PLC wireline bandwidths will interfere with each other. As companies find new uses for IoT sensors in tractor trailers, legacy trailer technologies should be considered.

Other ELD Technical Challenges: Bluetooth and Data Security

For device manufacturers, there are technical challenges. Through our interviews, we have asked several certified providers the number of Bluetooth pairings that they can accommodate in their device. None have been able to provide the answer immediately.

ELD test plan Section 4.1.2 - Account Creation requires each user of the ELD to have a valid active account on the ELD with a unique identifier assigned by the motor carrier. Section 4.10.1.4 - Data Transfer via Bluetooth states that the ELD must connect to roadside safety officials via a wireless network to transmit required data. The data transferred includes driver authentication. If the driver cannot pair with the ELD, they cannot be authenticated by safety officials.

Bluetooth pairing is often challenging and loss of power can result in loss of connectivity. ELD placement in the truck can limit wireless communication and full pairing queues can block a driver new to the vehicle from registering. Some device manufacturers in other use cases have purposely limited the number of Bluetooth pairings allowed to protect the sharing of service licenses.

Data security is another concern. To help prevent hacks, the ELD rule requires user credentials before allowing for collection of the vehicle’s ELD data.
Is there hope for the ELD Non-Believers?

The short answer is that ELD rule injunction before December 18, 2017 is unlikely. While the American Truck Association (ATA) supports the rule, the OOIDA has strongly objected to it and filed a court injunction on the ELD rule publication date citing “the most outrageous intrusion into the rights of professional truckers imaginable”.

It is interesting how history repeats itself. Back in the mid-1990s, telematics enabled the tracking of mobile workers. The reality is that mobile workers are drawn to the job because they do not like to be watched! The same reality is true of independent owner operators. Many of them have chosen to be independent because they do not like to be watched! The ELD rule lessens their independence.

In 2015 there were 136,585 HOS violations, where drivers violated their time limits.

As a last gasp, the Owner-Operator Independent Drivers Association (OOIDA) took their case to the U.S. Supreme Court. On June 12, 2017, the Court said it would not consider a petition by OOIDA to hear their argument against the requirement to install ELDs in heavy-duty trucks.

What is Next?

While it might seem to some that the FMCSA has been around for forever, it was established by the DOT on January 1, 2000 “to prevent commercial motor vehicle-related fatalities and injuries”. Prior to that time, carrier safety was a function of the DOT’s Federal Highway Administration. The FMCSA’s next moves are likely to be around telematics reporting (hard braking, excessive acceleration and speeding), Advanced Driver Assistance Systems (ADAS) technologies (automatic collision detection technology, blind spot notification and speed limit sign recognition), and reducing driver distractions beyond no texting and hands-free operation. New specifications could address in-vehicle display details (e.g. number of lines of text on a screen, font size/color, audible alert tone standardization, alert decibels, and other restrictions).

There is one non-technical reality that is not being discussed. Shippers and 3PLs will start requiring ELD compliance in their carrier’s Bill of Lading. The risk of having a 3rd party carrier shutdown due to ELD rule violations is too great. While everyone is looking toward public safety fines, they might want to look toward their clients.

To quote Pogo, “We have seen the enemy and he is us.” In June 2014 on the New Jersey Turnpike, a van was hit by the driver of a Walmart truck traveling 20 MPH over the speed limit. Tracy Morgan, an actor and star of NBC’s Saturday Night Live, was severely injured and another comedian passenger died in the crash. The driver was allegedly awake for 24 hours and had 28 minutes to finish his deliveries before violating the HOS rules – plus, the truck’s ABS had failed.

What a perfect illustration of the need for telematics! This is exactly the type of incident the FMCSA is trying to eliminate through the use of ELDs.

The ELD rule would not be necessary if the OOIDA, ATA, carriers, and each driver had policed themselves. The FMCSA was created to save lives and reduce injuries. It is only natural for the ELD rule to emerge and evolve. If there is a counter argument to the use of mandate of ELDs, let us hear it now, because arguments to date do not propose viable alternate solutions for reducing trucking fatalities.
Fleet Taxonomy

Over the last 25 years, I’ve helped many Fleet Management Service (FMS) providers define their segmentation and in doing so segment taxonomy has recently popped up as a challenge. It’s not uncommon for one segment to be referenced in several different ways. Is it “Waste Management” or “Sanitation?” “Distribution” or “LTL?” “Food Service” or “Vending?” Many professed segments are actually either sub-verticals or applications. Opening ten websites reveals different labels for one market segment. The fleet market has never created a standard taxonomy, but it sorely needs one.

**WHAT IS A VERTICAL?**

So, what is a Vertical? A Vertical is generally viewed as a group of customers with similar specialized needs. Does an HVAC service company have the same specialized needs as a Pharmaceutical Sales Representative? The answer is NO! Specialized needs can have a broad range of implications. For fleets, a good “specialized needs” metaphor is “use cases”. Use cases establish a product or service business need that can be monetized.

**WHAT IS A FLEET?**

If a Vertical is comprised of a group of customers with similar specialized needs, can a telematics equipped fleet be one vehicle? Yes and no. It depends on whether the vehicle is centrally- or self-dispatched. A self-dispatched pharmaceutical rep can have several telematics needs: miles driven, form fill, e-signatures, geofencing, routing, speed limit alerts, ELDs, and preventative maintenance among others. The vehicle is essentially a fleet of one. Centrally-dispatched fleets are generally viewed as containing 10 vehicles or more since a fleet manager is common for these fleets. Some publications and market studies limit their coverage and reports to fleets with 10 or more vehicles. Fleets containing two through 9 vehicles are left in the middle. Each group has its own specialized needs based on size, revenue and business “practices”.
**FLEET VERTICALS: MUST-DO AND TOP-FIVE**

Although in the early telematics days most fleets that used such services were dispatched, mobile technology had not advanced to the point where self-dispatched drivers were able to take full advantage of these services.

After studying many Top 100, 300, 500, and 1,000 fleet lists from different sources, I developed two acronyms of 5 verticals each (total of 10) for centrally-dispatched and self-dispatch fleets.

Dispatched fleet segments can be summarized by the acronym “MUST-DO.” (“If you only do one thing, you MUST-DO this!”) Dispatched fleets group into five major verticals:

- **Municipals**—Fire, Police, Public Transportation, Codes Inspectors
- **Utilities**—Electricity, Gas & Water
- **Services**—Arborists, Couriers, Florists, Waste Management
- **Trades**—Electrical, HVAC, Plumbing (skilled labor)
- **Delivery**—Less-than-Truckload [LTL]

Self-dispatched fleet segments can be summarized by the acronym “ToP-FivE.” These fleets group into 5 major verticals:

- **Technology**—Sales and technical service calls
- **Other**
- **Pharmaceuticals**—Sales and FDA sample filing
- **Food & Beverage**—Sales and vending
- **Insurance & Financial**—Sales and claims adjusters
- **Verticals**
- **Energy**—Oil & Gas (Fixed assets)

Using these market segments, a new Telematics Code System (TCS) can be built.

**WHY DO WE NEED A TCS?**

**THE GROWTH OF ENTERPRISES**

Using a 4 to 6 digit TCS code (similar to D&B, SIC or NAICS) structures allows for granular segmentation of the telematics market which uses different names to describe the same groups with specialized needs. Not too long ago, companies like Verizon and Avis were single-tracked. Today, these companies have grown into wide-ranging enterprises. Is Verizon a wireless carrier or a Telematics Service Provider? Verizon provides telematics service to over one million vehicles worldwide. Is Avis a Rent-A-Car (RAC) or telematics company? Recently, I.D. Systems received an order for 50,000 units from Avis Budget Group to expand their Wireless Rental Fleet Management System. How do you classify these companies for telematics? Both possess a considerable presence in the telematics market.

**THE PRACTICE AXIS**

Back to our two HVAC companies, do they have the same telematics needs? Maybe and maybe not. It depends on their size, revenue and business practices or the “P-Axis.”

Per the definition, a Vertical is a group of customers WITH specialized needs. Do these two companies work in new construction or existing structures? Do they accept
payments onsite? Do they need to read bar codes? Are they allowed to monitor driver behavior?

**THE OUTLIER: RENTAL CAR AND CAR SHARING**

Almost every market segmentation has an outlier. For fleets, it’s the RAC market. RAC companies have never been included in any traditional fleet listing for size or telematics installations. While this is a large vertical in terms of number of vehicles involved, it is a small vertical in terms of number of companies involved. The big three RAC companies—Enterprise, Hertz, and Avis—have a combined total of approximately 2M vehicles. Each company has vehicles that currently are or are being installed with telematics. After the big three, the size of RAC fleets drops off significantly.

**WHY DO FLEET MARKET SEGMENTS NEED CLASSIFICATION?**

Perhaps the lack of standard market segmentation definitions is intentional. It makes comparing service providers difficult. In the 1980’s, there was no way to easily look up competing products. The go to method of finding “stuff” was either the Yellow Pages or the Thomas Register. The challenge lay in determining the listing (classification) of what you wanted to find. Would the receptacle you wanted be listed as a “pail”, “bucket”, or “trash can”? Is it a “reefer” or “cold chain” fleet? If a reefer fleet was in the 02.01 classification and a cold chain fleet in the same TCS classification, it would be easy to find those companies.

The telematics industry is mature, yet we keep introducing new names for old things. To make it worse, many telematics companies today are labeling themselves as IoT companies because they link to an OBD2 dongle or use LPWA networks. If 99% of a business’ revenue is from telematics, it’s a telematics company!

**SERIOUSLY, WE CAN DO BETTER**

We can do better. I recently went to a conference to cover a section of presentations with eight supposedly IoT-centered sessions. The presentations contained SCADA, regulatory, security, video surveillance, and other topics, but not a single one covered IoT. At least, they could have mentioned we would have 50B connected devices by 2020!

Our market is full of misnomers, hype, and pseudo-platforms. Creating a common taxonomy will help us communicate better, fill ecosystem gaps more effectively, and find partners. Taxonomy is a branch of science concerned with classification. Without a classification system, we are left to invent our own terms for common things leading to the market confusion that we are experiencing today.
James Brehm & Associates is a consulting and marketing intelligence firm that provides project-based and retained strategic advisory services to technology companies worldwide. With a firm focus on the Internet of Things (IoT), Machine-to-Machine (M2M) Communications, and Big Data Analytics, James Brehm & Associates provides actionable insight and direction to a wide range of organizations including Communications Service Providers, Hardware Manufacturers, Software Vendors, OEMs, Private Equity, and venture Capital Firms. Through projects on market size and share, competitive intelligence, product development, go-to-market strategy, and client-specific consulting services, we help companies reach their maximum potential. [http://www.jbrehm.com](http://www.jbrehm.com)

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