Three Months In - Effects of the ELD Mandate in Trucking

Dave Osiecki, President
dosiecki@scopelitisconsulting.com
202 728 2851
Overview

- Three Months In - Effects of the ELD Mandate
  - Some Industry #s
  - Some HOS Compliance Data
  - AOBRDs vs ELDs & Why It Matters
  - The Enforcement Environment & Why It Matters
  - The Effects – Some Data, Some Press Articles & Some Expert Opinions

- Summary

- Autonomous Truck Technology
ELDs – Some Industry Numbers
ELDs – Some Industry Numbers

- 524,000 interstate carriers
  - 4,100 with > 100 power units
- 3.7 million interstate drivers
  - 3.1 million with CDLs
- 2.2 million intrastate drivers
- 2.75 million combination trucks
- > 8 million straight trucks

Sources: FMCSA & ATA
ELDs – Some Industry Numbers

- No one knows how many trucks and drivers must have ELDs
  - 3.1 million drivers with interstate CDLs
  - 2.75 million combination trucks
  - > 8 million straight trucks

- Safe bet - **At least 3.1 million** trucks & drivers are subject to ELDs

- Stretch bet – Maybe 3.9 million or more
ELDs – The Bottom Line on Industry Numbers

➤ How many trucks & drivers must have ELDs
  ✅ At least 3.1 million?

➤ In 2017, no one knew how many trucks and drivers were already using AOBRDs
  ✅ Probably in the 1.5 million range?

➤ Hard to guage effects if basic numbers are not known but...
ELDs – Some Hours of Service/Logbook Compliance Data
CVSA RoadCheck Data

Total ROADCHECK Inspections

- 2013: 75,000
- 2014: 73,475
- 2015: 69,472
- 2016: 62,796
- 2017: 62,013
CVSA RoadCheck Data

Drivers Findings - %
2013

95.7
4.3

Drivers Findings - %
2014

95.2
4.8

Drivers Findings - %
2015

95.2
4.8

Drivers Findings - %
2016

96
4
CVSA RoadCheck Data

Drivers Findings - %
2017

95.3
4.7

No OOS Viols
OOS Viols
### CVSA RoadCheck Data

#### Percentage of Driver OOS Violations

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOS</td>
<td>50.3</td>
<td>46.5</td>
<td>46</td>
<td>46.8</td>
<td>32.3</td>
</tr>
<tr>
<td>False Logs</td>
<td>14.8</td>
<td>13.7</td>
<td>12.6</td>
<td>16</td>
<td>11.3</td>
</tr>
<tr>
<td>Disqualified</td>
<td>10.2</td>
<td>12.7</td>
<td>7.6</td>
<td>6.2</td>
<td>3.4</td>
</tr>
<tr>
<td>Improper Endorsement</td>
<td>4.9</td>
<td>4.3</td>
<td>0</td>
<td>7.7</td>
<td>0</td>
</tr>
<tr>
<td>Drugs/Alcohol</td>
<td>1.5</td>
<td>1.1</td>
<td>2.1</td>
<td>10</td>
<td>1.6</td>
</tr>
<tr>
<td>Age</td>
<td>0.6</td>
<td>2.1</td>
<td>0</td>
<td>0</td>
<td>0.4</td>
</tr>
</tbody>
</table>
CVSA RoadCheck Data - Summary

- Only 4.5% of drivers are placed Out-of-Service (OOS) during RoadCheck inspections

- Slightly more than half of these drivers are OOS for hours of service violations

- 2017 data reflects even fewer drivers OOS for hours of service violations
AOBRDv. ELDs & Why It Matters
AOBRDs v. ELDs – Highlighting Some Differences

<table>
<thead>
<tr>
<th>Device Functionality</th>
<th>AOBRDs</th>
<th>ELDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Integral Synchronization” With Vehicle</td>
<td>Required but term is not defined in FMCSA rules</td>
<td>Integral synchronization required. ELD must interface with CMV engine control module to automatically capture engine power status, vehicle motion, miles driven, engine hours. (CMVs older than MY 2000 exempted)</td>
</tr>
<tr>
<td>Recording CMV Location</td>
<td>Required at each change of duty status. Manual or automated</td>
<td>Automated entry required at each change of duty status, at 60-minute intervals while CMV in motion, at engine on and off, and at beginning and end of personal use and yard moves</td>
</tr>
<tr>
<td>Graph Grid Display</td>
<td>Not required. Only time and sequence of duty status changes must be shown, including starting time of each day</td>
<td>Required. Must be able to show a graph grid of driver’s day either on display or on a printout</td>
</tr>
<tr>
<td>HOS Advisory or Warning Messages</td>
<td>Not required or addressed</td>
<td>Not required. Except, ‘Unassigned driving time/miles’ warning must be provided upon login</td>
</tr>
<tr>
<td>“Default” Duty Status</td>
<td>Not required or addressed</td>
<td>On-duty not driving status, when CMV has not been in-motion for 5 consecutive minutes, and driver has not responded to required ELD prompt within one minute. No other non-driver initiated status change is allowed.</td>
</tr>
<tr>
<td>Communication/Data Transfer Methods to Law Enforcement</td>
<td>Not addressed – some interface between AOBRD support system and printer</td>
<td>Required. Two Options: 1. Telematics-must transfer data via both wireless web services and wireless email 2. Local Transfer-must transfer data via both USB 2.0 and Bluetooth Both types of ELDs must be capable of displaying standardized ELD data set to authorized safety officials via display or printout</td>
</tr>
<tr>
<td>Resistance to Tampering</td>
<td>AOBRD and support systems must be tamperproof to maximum extent practical</td>
<td>Must not permit alteration or erasure of original information collected concerning driver’s record, or alteration of the source data streams used to provide that information. ELD must support data integrity check functions</td>
</tr>
<tr>
<td>Sensor Failures and Edited Data</td>
<td>Must identify sensor failures and edited data</td>
<td>Must have capability to monitor its compliance (engine connectivity, timing, location, etc) for detectable malfunctions and data inconsistencies. ELD must record these occurrences.</td>
</tr>
</tbody>
</table>
AOBRDs v. ELDs – Highlighting Some Differences

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<thead>
<tr>
<th>Device Display</th>
<th>AOBRDs</th>
<th>ELDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver CDL Information</td>
<td>Not required or addressed</td>
<td>Must be displayed in header of daily ELD record</td>
</tr>
<tr>
<td>CMV VIN Number</td>
<td>Not required or addressed</td>
<td>Must be displayed in header of daily ELD record</td>
</tr>
<tr>
<td>Carrier DOT Number</td>
<td>Not required or addressed</td>
<td>Must be displayed in header of daily ELD record</td>
</tr>
</tbody>
</table>
# AOBRDs v. ELDs – Highlighting Some Differences

<table>
<thead>
<tr>
<th>Operational &amp; Miscellaneous Issues</th>
<th>AOBRDs</th>
<th>ELDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Unassigned Driving” Time</td>
<td>Not required or addressed</td>
<td>Must be captured and driver must approve or reject at time of login. If rejected, back office staff must reconcile and retain</td>
</tr>
<tr>
<td>“Special Driving Categories - Yard Moves”</td>
<td>Not required or addressed by rule. Market has resulted in vendor inclusion in AOBRDs</td>
<td>Defined under new “special driving categories” section. If used, must be selected and deselected manually by driver, and is captured as “on-duty not driving” while in private yard. No mileage or time limits prescribed. Carrier may elect not to use special category</td>
</tr>
<tr>
<td>“Special Driving Categories – Authorized Personal Use” of CMV</td>
<td>Not required or address by rule. Market has resulted in vendor inclusion in AOBRDs</td>
<td>Defined under new “special driving categories” section. If used, must be selected and deselected manually by driver, is shown on graph grid as driving time but is, by definition, “off duty” time. Carrier may elect not to use special category</td>
</tr>
<tr>
<td>Driver Edits</td>
<td>Not required or addressed</td>
<td>Editing function must be provided to driver for mistakes. All edits must also be “annotated.” Driving time may not be edited by driver.</td>
</tr>
<tr>
<td>Office Support Staff Edits</td>
<td>Not required or addressed</td>
<td>Edits by office staff allowed. All edits must be “annotated” and all office staff edits are pending until accepted by driver.</td>
</tr>
<tr>
<td>Driver Certification of Daily Record</td>
<td>Not required or addressed</td>
<td>Required driver certification after the final required entry has been made or corrected for each 24-hour period.</td>
</tr>
<tr>
<td>User Accounts</td>
<td>Not required or addressed. Market has resulted in user IDs and passwords</td>
<td>Unique username (and other required driver information) required for all authenticated drivers/users.</td>
</tr>
<tr>
<td>Device Malfunctions – Time Period to Repair or Replace</td>
<td>Not addressed</td>
<td>Driver must notify company in writing within 24 hours of device malfunction. ELDs must be repaired or replaced by company within 8 days. Driver must revert to paper logs during ELD malfunction period.</td>
</tr>
<tr>
<td>Device Registration &amp; Certification</td>
<td>Not addressed</td>
<td>All ELDs must be registered with FMCSA, and self-certified by each vendor as compliant. Registered and certified ELDs are listed on FMCSA ELD website. Carriers may only select and use certified ELDs.</td>
</tr>
</tbody>
</table>
For Early Adopting AOBRD Fleets – The New ELD Rules...

- Create a training need
- Create new administrative burdens
- Create new record retention
- Drive new company policies
- Potentially raise costs
- But ‘flipping the switch’ to ELD software does not affect capacity
For Paper Log Fleets –
The New ELD Rules...

- Create a host of needs...
- Create new burdens
- Create new record retention
- Drive new company policies
- Force technology adoption & raise costs
- Create potential safety improvements
- Could affect certain lanes; Paper to ELDs will likely affect capacity for some
The Enforcement Environment & Why It Matters
The ELD Enforcement Environment

- Aug 2017 - CVSA announces 4 mo. delay in ELD-related OOS orders
  - Soft enforcement - Dec 18 – Mar 31, 2018
  - Hard enforcement – Begins April 1, 2018

- Nov 2017 – FMCSA announces 4 mo. delay in assignment of CSA points
  - CSA points for ELD violations begin April 1, 2018
States delaying ELD ticket writing until April 1

States leaving ticket writing to the discretion of the individual officer

Oregon DOT is not issuing citations at scale houses and is encouraging state police and local departments to follow along.
Soft enforcement by CVSA and FMCSA has resulted in a perceived new compliance deadline of April 1, 2018

- Some carriers still on paper logs
- Some carriers have ELDs installed but not using them
The ELD Enforcement Environment

- What good is a law if it’s not enforced?

- No enforcement & no consequences = less compliance
The Effects of The ELD Mandate?
A Shortage of Trucks Is Forcing Firms to Cut Shipments or Pay Up

Several factors have converged to overwhelm the trucking market. Freight volumes in December hit near-record levels for that time of year, on the back of a strengthening economy. Retailers are replenishing stocks after one of the strongest holiday sales seasons in recent years. Manufacturers are also shipping more cargo; in December, industrial production had the largest year-over-year gain since 2010, according to the Federal Reserve. What’s more, bad weather and a new federal safety rule that took effect in December have crimped the supply of available trucks. Diesel prices are near a three-year high, adding to transportation costs.

Wall St Journal, January 25, 2018
“Freight Rates Soar for Small-Business Truckers in January”

Clarissa Hawes, Trucks.com, January 29, 2018

A stronger economy, the implementation of the federal electronic logging device mandate and inclement weather have pushed the need for more for trucking services, bumping up rates significantly from a year earlier, said Mark Montague, an analyst at DAT Solutions, which tracks freight and rates. In 2017, the DAT network finished with 179 million load and truck postings. This was up 79 percent compared with 100 million in 2016.

“Owner-operators are doing extremely well in the spot market right now,” Montague told Trucks.com.
ELD Effect – Logistics Mgmt Survey

- Truckload shippers surveyed – 349 responded; results published March 8, ‘18

- Securing TL capacity since ELDs
  - 58% - sometimes a problem
  - 27% - usually or always a problem
  - 15% - not a problem
ELD Effect – Logistics Mgmt Survey

- ELD impact on freight rates?
  - 27% - rates up 15% or higher
  - 22% - rates up 11-15%
  - 39% - rates up 5-10%
  - 13% - rates rose < 5%

- Rates higher than a year ago?
  - 84% yes; 16% no
ELD Effect – Expert Opinion, ATA

- **3 Things Drive Trucking’s Economy**
  - Consumer spending
  - Construction activity
  - Factory output

- **Demand Side**
  - Demand for trucks up (factory output up, etc)
  - Glut of inventory is gone
  - 4th Q demand up 7% year over year (dry van)
ELD Effect – Expert Opinion, ATA

- **Supply Side**
  - Demand “completely wiped out excess supply”
  - Lots of truck orders but for replacements, not increased fleet capacity
  - For-hire supply/capacity constrained by lack of qualified drivers...a real problem

- **But What About ELDs?**
  - Little evidence thus far of an ELD effect
  - It’s the economy...and the driver shortage
ELD Effect – Expert Opinion, Investment Services Firm

- “ELDs are having an impact”
- Reefer segment (live load) is impacted
  - Waiting time problematic (produce)
  - Rates are up 10-15% y/o/y
- Large food shippers calling out increased transpo costs
  - Hormel, Smuckers, Tyson mentioned
ELD Effect – Expert Opinion, Investment Services Firm

- Brokerage biz seeing ELD impact
  - 400–600 mile length of haul impacted
  - Pockets with higher rates
- LTLs seeing lots of spillover TL freight
- But ELD effect on OTR TL “too hard to tell”
- “Greater capacity crunch coming in April”
  - Produce season
  - Lawn and garden season
ELD Effect – Expert Opinions

- Noel Perry, Economist, Transport Futures
  - Productivity & capacity have been impacted going back to last Fall
  - Likely be a significant reduction in productivity as ELD adoption % rises...to happen by April

- Mike Regan, TranzAct Technologies
  - “Impact of the ELD mandate so far is every bit as consequential as people thought it would be, and the impact to date...is more significant than was anticipated.”
ELD Effect – Some Observations

- Ample evidence of strong economy
  - Job & wage growth, consumer spending, factory output, construction activity

- Ample evidence of a real & growing driver shortage
  - Few carriers able to find qualified drivers

- Ample evidence of incr trucking rates
**ELD Effect – Some Observations**

- Almost no hard evidence of ELD impacts
  - Surveys, opinions, predictions, etc

- Could change as 2018 moves forward
  - Year over year comparisons in some markets, lanes, etc?
  - Case studies?
Industry numbers & ELD use data is lacking

Historical HOS data from enforcement - non-compliance rate is <5%

Switch from older AOBRDs to ELDs does not affect capacity (1.5 mil trucks)

✔ Paper logs to ELDs can and likely does...in a small way
Current ELD enforcement environment likely to change on April 1, 2018

Lots of data/evidence of a stronger economy driving demand for trucking

Lots of opinions on ELD effects, but little evidence and hard data
Trucking Technologies & Autonomous Trucks
Autonomous Trucks – Levels of Automation

Levels of Autonomy

0. No Automation
1. Driver Assistance
2. Partial Automation
3. Conditional Automation
4. High Automation
5. Full Automation

HUMAN DRIVER monitors driving environment

AUTOMATED DRIVING SYSTEM monitors driving environment
Autonomous Trucks – The Tech

- Advanced Driver Assistance Systems” or ADAS

Building Blocks for Automation

- AEBS
- LKA
- RSC
- ACC
- LDW
- FCW
- ABS
- ESC
Autonomous Trucks – The Tech

- Additional Advanced Driver Assistance Systems” or ADAS
  - Blind spot detection
  - Pedestrian detection
  - Traffic sign recognition
  - Surround view
  - And more
Autonomous Trucks – The Tech

- Technologies to integrate ADAS features
  - Long range radar
  - Short and medium range radar
  - LIDAR
  - Cameras
  - Host of sensors
  - AI software
Types of Operations
Autonomous Trucks - Operations

- A Long Haul Focus
- Uber, Embark, Waymo?
  - Interstate highways
  - Favorable geography, weather
  - Entrance ramp to Exit ramp
  - Extended stretches

![Diagram of autonomous truck operations](image)
Autonomous Trucks - Operations

- Long & Short Haul Focus
- Starsky Robotics
- TU Simple
  - Interstate highways
  - And urban environments
  - Terminals/yards
  - Driverless Level 4 (and 5...)
  - Remote operation similar to drone operators
Autonomous Trucks - Operations

- Platooning - Peloton Technology, Others?
  - Interstate highways
  - Both Planned and Ad Hoc Pairing
  - Second Vehicle Level 4 (and 5?)
  - Safety & Fuel Economy Benefits?
Potential Benefits, Concerns & Other Issues
Autonomous Trucks

Potential Benefits

- SAFETY!
- Driver Alertness
- Greater Freight Efficiency
- Greater Industry Productivity
- Addressing Long-haul Driver Shortage
- Demographics
Autonomous Trucks

- Potential Concerns
  - Pace of Innovation
  - How to Regulate Design and Operations
  - Jobs & Workforce Issues
  - Cybersecurity
  - Insurance & Liability
Autonomous Trucks

➢ Other Challenges
   ✓ Human-Machine Interface
   ✓ Unpredictable Humans
   ✓ Basic Infrastructure Needs
   ✓ Weather
   ✓ Scope & Cost of Digital Mapping
   ✓ Cost & Industry/Public Acceptance
   ✓ Law Enforcement
Autonomous Trucks – Govt’s Role

- The Congress – Trying to Establish a National Framework

- The USDOT Role
  - NHTSA, FHWA, FMCSA

- The States Role
  - Licensing, insurance, enforcement
Autonomous Trucks – Summary

- Investment is incredible
- Industry Innovation & Pace is Remarkable
- Government Figuring Out Its Role
- Critical Questions
  - How safe is safe enough?
  - How long for govt to regulate?
  - How long until public accepts AVs?
Before Wrapping Up...
STC Scope of Services

- Regulatory Compliance & Safety Consulting
- On-site & Webinar Training (IC Relations, Active Shooter)
- Mock DOT Audits & Pre- & Post- Audit Help
- Tax & Vehicle Registration Services
- DC-based Advocacy & Industry Representation
- Speaking Engagements/Industry Presentations
Thank You

Dave Osiecki, President
dosiecki@scopelitisconsulting.com
202 728 2851