

IN-DEPTH RESEARCH REPORT

# IN-CAB TECHNOLOGY



J. J. Keller®  
COMPLIANCE  
NETWORK

# INTRODUCTION

Compliance, risk management, and operational efficiency are essential to motor carriers' success. Current transportation industry headwinds include, but are not limited to:

- ▶ Excessive or so-called “nuclear” verdicts against carriers,
- ▶ General labor shortages and driver turnover, and
- ▶ Increased regulatory oversight.

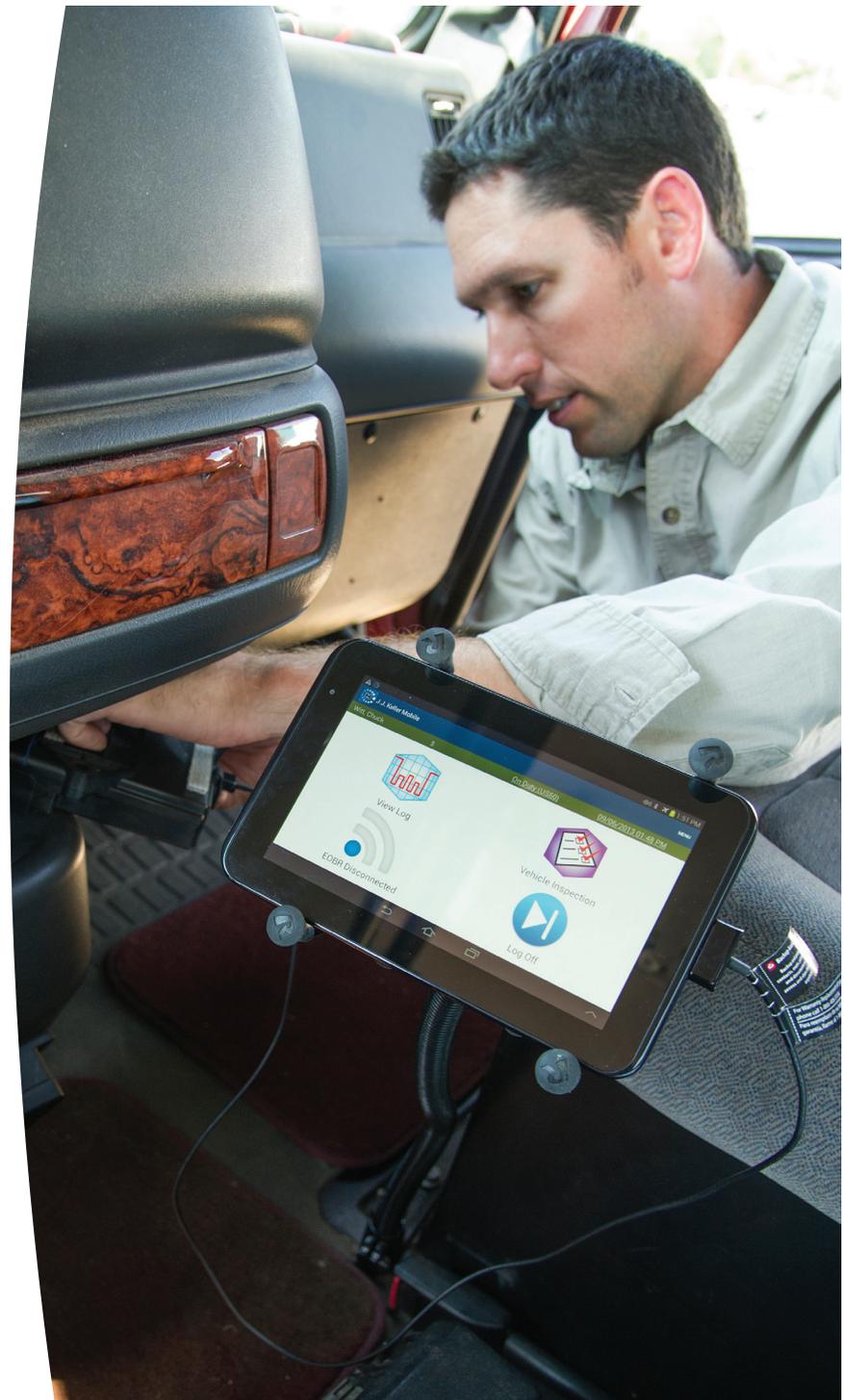
In March of 2023, the J. J. Keller Center for Market Insights conducted the *In-Cab Technology Pulse Poll* of safety professionals at light/medium duty fleets. The survey's purpose was to understand better their experience with and perception of in-cab technology, including:

- ▶ Electronic logging devices (ELDs),
- ▶ Dash cams (video event recorders), and
- ▶ Vehicle tracking devices.

It was evident from the poll results that these devices have become integral countermeasures to those industry headwinds.

For each of the three devices included in the poll, this report will:

1. Provide an overview of the device,
2. Highlight the top benefits, and
3. Offer expert commentary addressing the top challenges.





## FINDINGS

THE POLL'S THREE HIGH-LEVEL TAKEAWAYS WERE THAT IN-CAB TECHNOLOGY WAS:

- 1. ADOPTED BY A VAST MAJORITY OF CARRIERS**
- 2. INSTALLED TO ENSURE COMPLIANCE AND REDUCE RISK**
- 3. USED TO IMPROVE EFFICIENCY, PRODUCTIVITY, AND CUSTOMER SERVICE**

The top challenges of using in-cab technology had these common themes:

- ▶ Driver privacy and acceptance,
- ▶ Cost,
- ▶ Technology malfunctions or barriers.

## WHO DID WE ASK?

To qualify to complete the survey, respondents:

- 1.** Needed to work for an organization that has vehicles operating on public roads
- 2.** Have ELDs, dash cam, or vehicle tracking in those vehicles
- 3.** Have responsibility for managing or making the purchasing decisions for in-cab technology

**82** PEOPLE started the survey.

After meeting all three criteria above, **49** of the **82** participants

**53%** were eligible to complete the survey.

- ▶ The predominant fleet size was between **21** and **100** vehicles.
- ▶ **68%** to **81%** of fleets adopted at least one of the three devices.
- ▶ **79%** of the respondents' fleet vehicles had in-cab technology installed.
- ▶ **40%** of fleets included passenger cars and minivans (non-regulated vehicles).



## IN-CAB TECHNOLOGY OVERVIEW

A basic understanding of each device's purpose is essential before digging into the poll results.

## ELECTRONIC LOGGING DEVICES (ELDS)

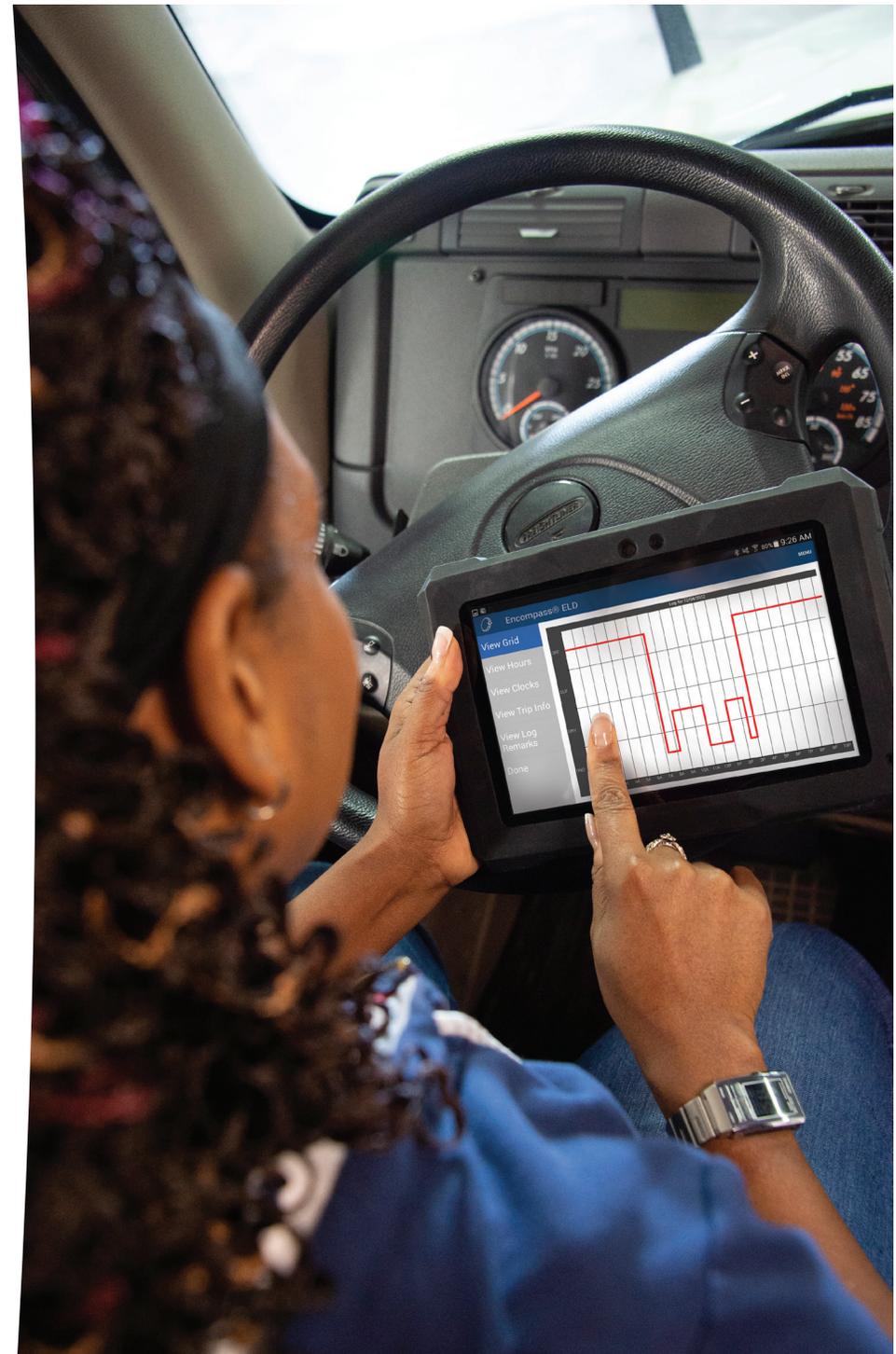
An ELD must connect to a vehicle's electronic control module (ECM) to:

- ▶ Automatically record a commercial motor vehicle (CMV) driver's driving time, and
- ▶ Accurately record the driver's hours of service.

Vendors must register each ELD on the Federal Motor Carrier Safety Administration's (FMCSA's) ELD list and comply with the technical specifications in 49 CFR Part 395, Subpart B, Appendix A.

Drivers must use an ELD unless they are exempt from logging, such as drivers who operate within 150 air miles of their start location or log eight or fewer times in 30 days.

Canada has required ELDs for interprovincial and U.S. carriers operating in Canada since January 1, 2023, with some provincial mandates that started during 2023.



## DASH CAMS (VIDEO-EVENT RECORDERS)

Dash cams capture 10- to 20-second video clips of triggered driving events, allowing carriers to identify and correct the risky behavior, provide evidence for post-crash litigation, and foster a safety culture.

The most advanced dash cams monitor unsafe behaviors, such as:

- ▶ Handheld cellphone use;
- ▶ Lack of seat-belt use;
- ▶ Fatigued driving/lane drift;
- ▶ Excessive speed, speeding, and other traffic violations; and
- ▶ Following too close/hard braking.



## VEHICLE TRACKING DEVICES OR GLOBAL POSITIONING SYSTEM (GPS) TRACKERS

Vehicle trackers are a GPS-based telematics device that provides near real-time vehicle information without driver interaction. Data can include the vehicle status (on/off, moving or stationary), frequent location updates, area traffic and weather, and GPS-determined speed.

Vehicle trackers can plug directly into a vehicle's diagnostic port and transmit data to the back-office system via cellular networks.

Additionally, electronic boundaries (geo-fence limits) can be set for terminals and other locations, such as shipper and delivery locations. Tracking the location of drivers helps measure workflow and productivity.





## TOP BENEFITS

The benefits of technology are evaluated in terms of the cost to acquire and maintain the devices compared to the time saved and the value of the information provided.

## ELECTRONIC LOGGING DEVICES (ELDS)

Hours-of-service rules are in place to reduce driver fatigue and crashes. ELDs compliance to the minute with little input or additional work from drivers.

The improvement of safety and compliance was cited by 89% as the top benefit of using ELDs.

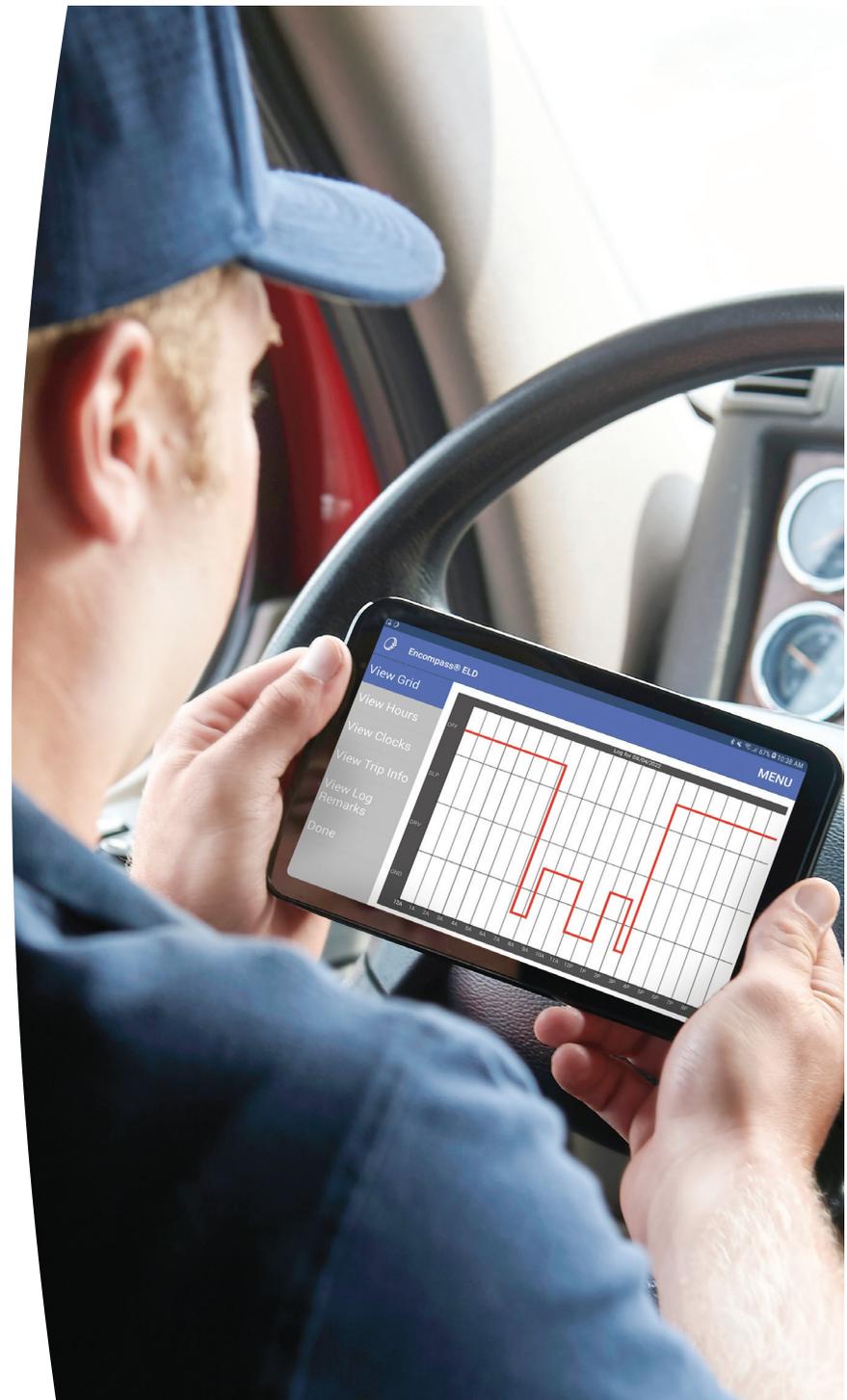
The other two cited in the Top-3 benefits pertain to operational efficiency and included:

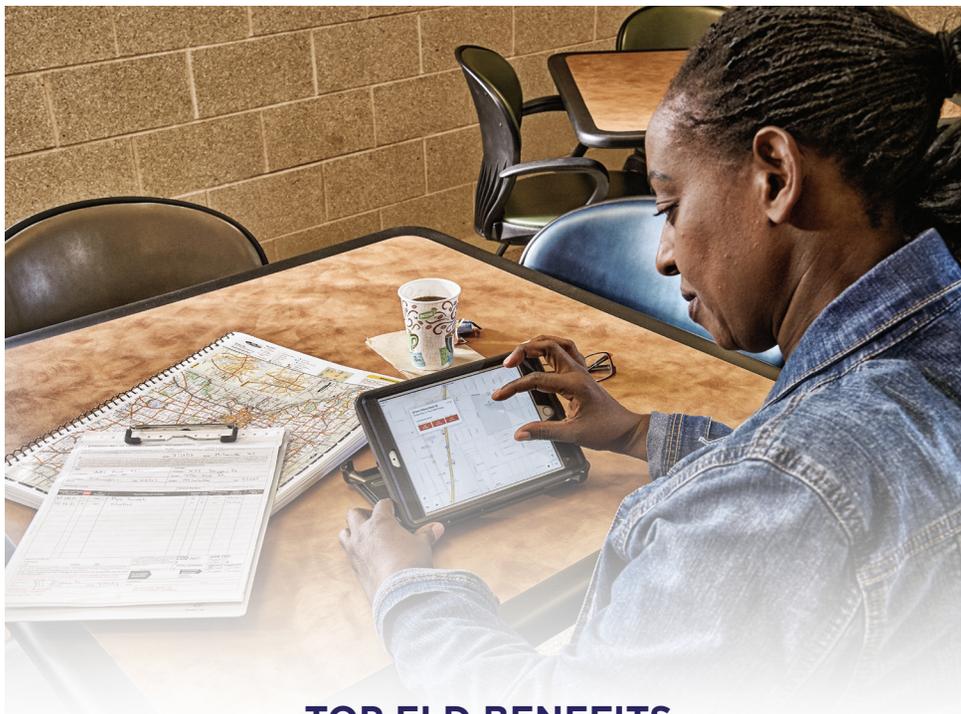
- ▶ Less paperwork (68%), and
- ▶ Streamlined operations (43%).

ELD records can be falsified, causing safety to be compromised. Auditing paper logs was laborious and often resulted in missing errors or intentional concealment of driving over hours. However, automated reporting from ELD records makes audits more manageable and effective.

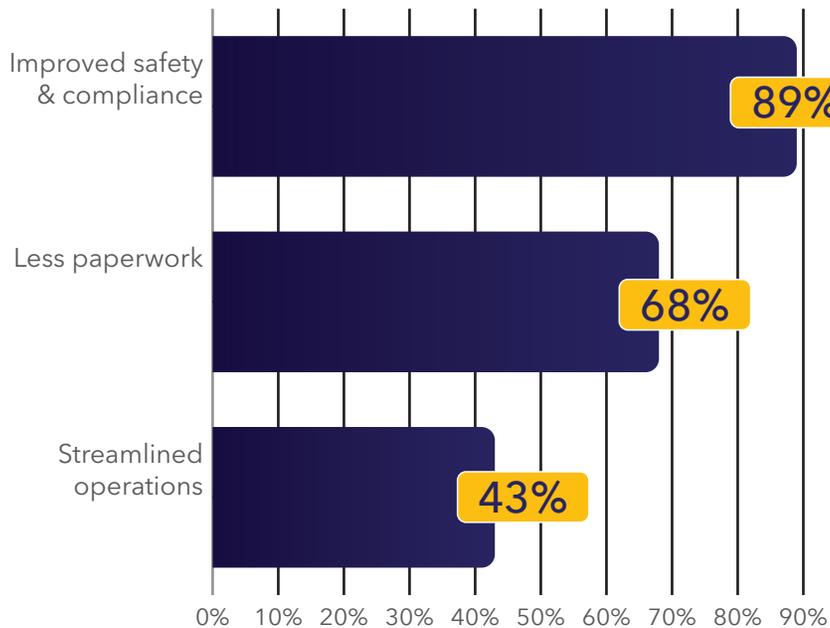
ELD falsification includes:

- ▶ Unassigned driving to exceed driving limits,
- ▶ Unplugging an ELD or the use of personal conveyance to reposition closer to a business location,
- ▶ Minimal logging of on-duty (not driving) time, and
- ▶ Editing to create more driving time.





### TOP ELD BENEFITS



ELDs also eliminated time-consuming driver updates of paper logs and check-in calls to dispatch during stops.

Back-office personnel can view their drivers' up-to-date ELD hours before assigning work that a driver can complete in the available hours instead of unknowingly pushing drivers to work beyond the limits.

Additionally, driver performance management via easily accessible ECM data can help improve the driver's skills and fuel mileage, creating a significant return on investment (ROI) in ELDs.

Further efficiencies for interstate carriers come from using ELD records to automate International Fuel Tax Agreement (IFTA) and International Registration Plan (IRP) reporting and eliminate driver trip reports, postage, and processing costs.

A respondent captured the benefits of using a top-tier vendor's ELD when compared to the cost:

“

*We have streamlined employee safety and satisfaction. The vendor has allowed our safety department to streamline costs, allowing us to give back to our employees. We feel that the cost is worth our improvements for our company!*

”

## DASH CAMS (VIDEO-EVENT RECORDERS)

A carrier's actions are judged in court by what they should have known and done, not what they took the time to find and correct. Without reviewing and acting on video, much of the unsafe behavior goes unnoticed by carriers.

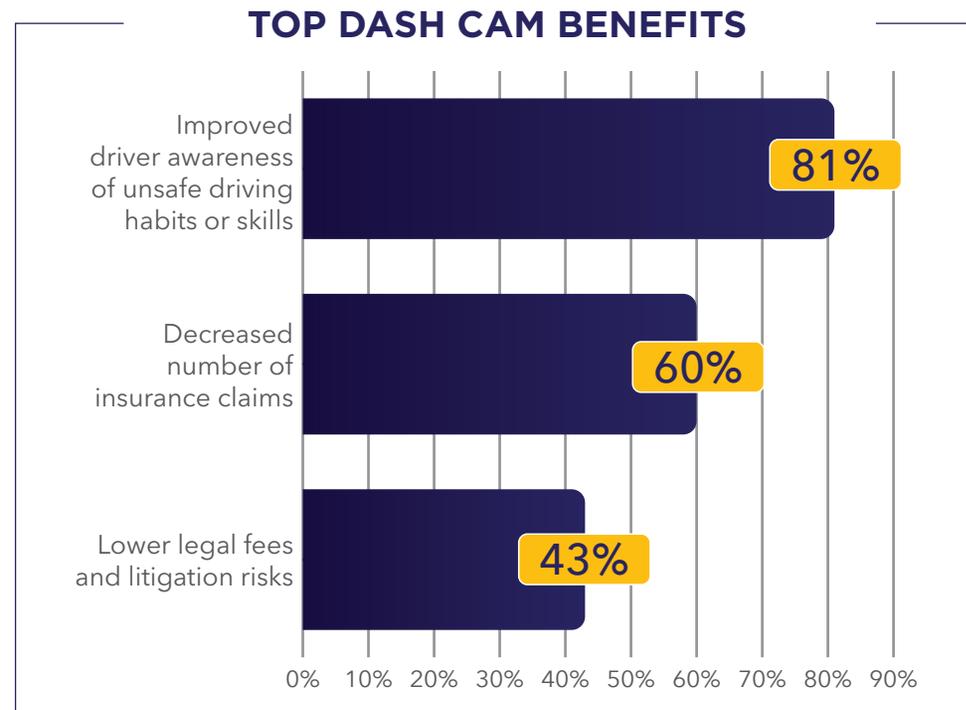
The top benefit of dash cams was not a surprise. Still, the high percentage (81%) that cited "Improved driver awareness of unsafe driving habits or skills" shows that carriers use videos for far more than driver exoneration after a crash. One instance of post-crash driver exoneration could save the entire cost of a dash cam system. Additionally, proof of the driver's innocence may avoid hiring and training a new driver.

The next most frequently cited benefits relate to reducing unsafe behaviors that cause crashes at the following percentages of respondents:

- ▶ Decreased number of insurance claims (60%), and
- ▶ Lower legal fees and litigation risks (43%).

Also, the following verbatim comment from the poll is typical of carriers transitioning to the use of dash cam-driven events coaching, which changes safety cultures for the better:

“  
We are just starting to use dash cams and are excited to see the results.  
”



# VEHICLE TRACKING

The top benefits relate to staying cost-competitive and keeping customers satisfied.

By far, the number one benefit, as selected by 87% of respondents, is the ability to see vehicle locations and other telematics data in real time. While far fewer chose “improved customer satisfaction” at 36%, knowing the driver’s location and expected arrival times enhances customer satisfaction.

Improved productivity was the third most important benefit at 29% and came from actions like:

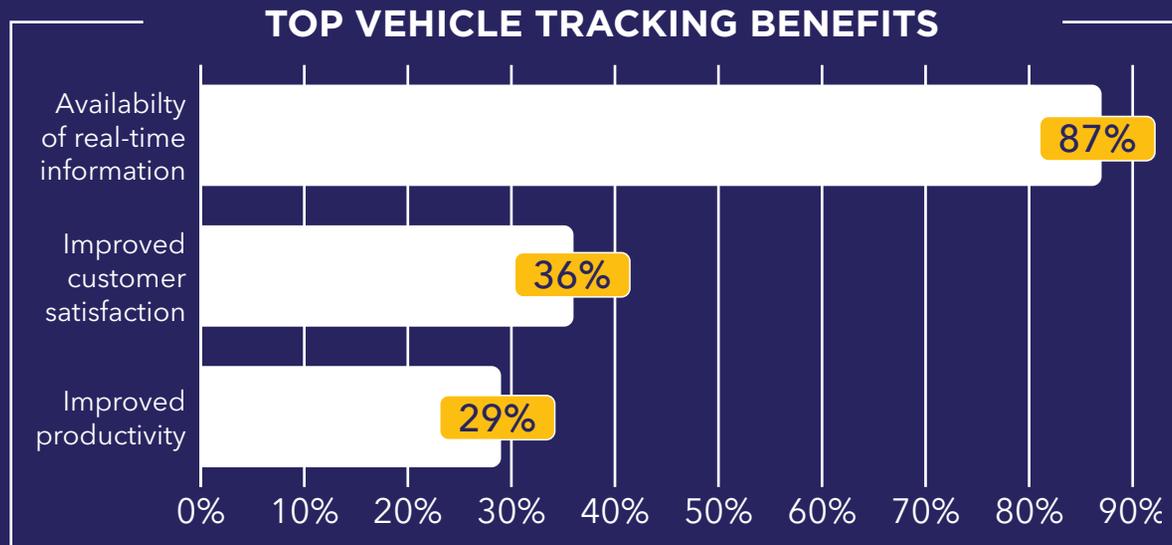
- ▶ Monitoring and reducing delays at problem locations and unsafe driving with particular drivers,
- ▶ Choosing more efficient routing and tracking unnecessary movements and fuel use, and
- ▶ Acting on returning idle vehicles to productive use.

## These verbatim comments from respondents convey other benefits as well:

“Tracking helps in case of accident or breakdowns. I can direct my staff to the asset easily.”

“Tracking unnecessary yard moves by wash bay/mechanics.”

“Vehicle tracking has been helpful also collecting data for unsafe driving.”





## TOP CHALLENGES

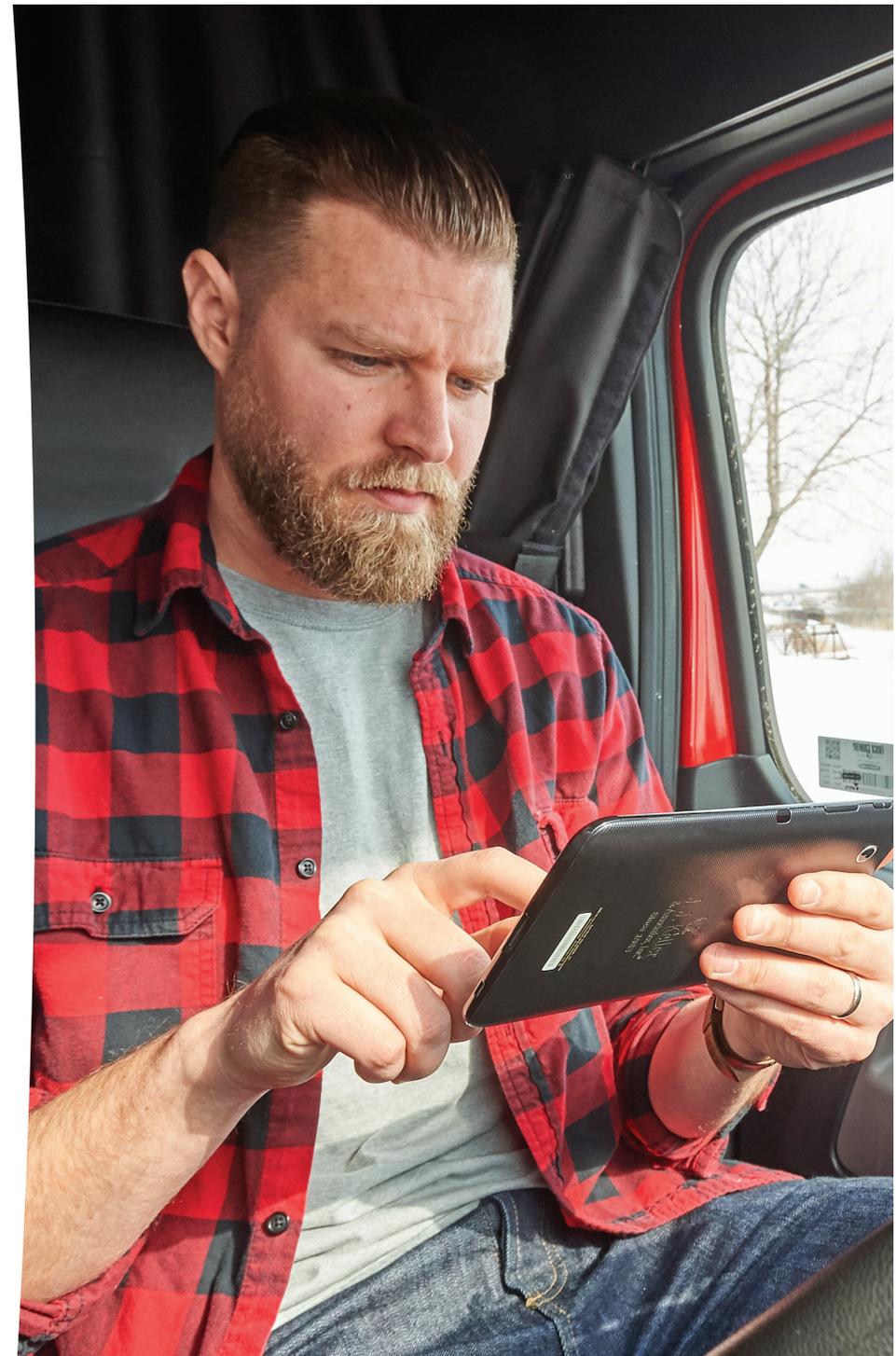
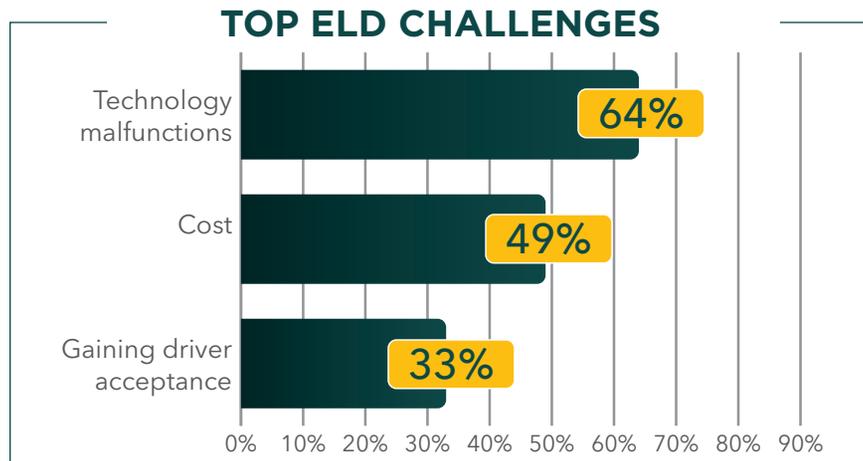
The three devices share cost and driver privacy/acceptance as challenges, along with one unique to each device. In this section, our experts will weigh in on each challenge.

## ELECTRONIC LOGGING DEVICES (ELDS)

A verbatim comment in the poll captured the reality of the role ELDs play, and an opinion shared by some on the current rules:

*“ELDs are fine; the basic rules they strictly enforce are the problem. The HOS need to change!”*

ELDs help compliance with the rules in place. As previously noted, the device has critical benefits. The top challenges with the respondents' percentages and experts' thoughts are below.



## WHAT DO OUR EXPERTS SAY?



### TECHNOLOGY MALFUNCTIONS (64%)

Driver and back-office personnel training on the daily use of ELDs, along with a dependable ELD vendor, are the best ways to minimize malfunctions that cause inaccurate hours-of-service records.

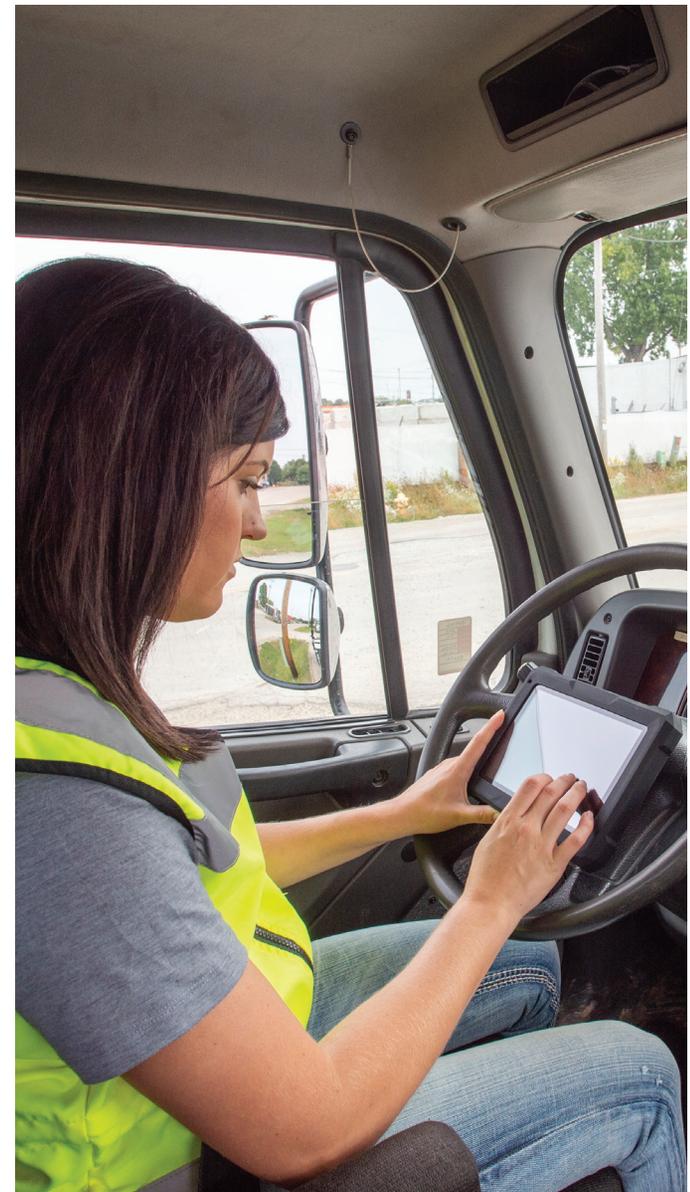
Training to manage a malfunction should also occur and include:

- ▶ Procedures that a driver and carrier must follow after a malfunction per 395.34, which entails drivers recreating the prior seven days' logs manually, ELD record printouts, or using the ELD display;
- ▶ Documentation, within 24 hours, of the carrier's notification of the malfunction, and repair of the ELD within eight days of the malfunction; and
- ▶ Manual preparation of logs, which is required until the ELD is fixed.

### COST (49%)

The cost of an ELD system, which includes the in-cab devices and the back-office software, can be offset by efficiencies noted under the Top Benefits.

Also, consider the prior costs of purchasing, filing, retrieving, and destroying paper logs after the six-month retention period for every driver on every workday, along with processing trip report packages. This was a labor-intensive paper-shuffling process, providing no value to customers. Add to that the excessive audit time for paper logs.





## WHAT DO OUR EXPERTS SAY? (Cont.)

### GAINING DRIVER ACCEPTANCE (33%)

Coaching and correcting drivers to avoid hours-of-service violations helps them and the company to achieve lower (better) Compliance, Safety, Accountability (CSA) scores in the “Hours-of-Service Compliance” Behavioral Analysis Safety Improvement Category (BASIC). Lower carrier CSA scores also result in fewer roadside inspections.

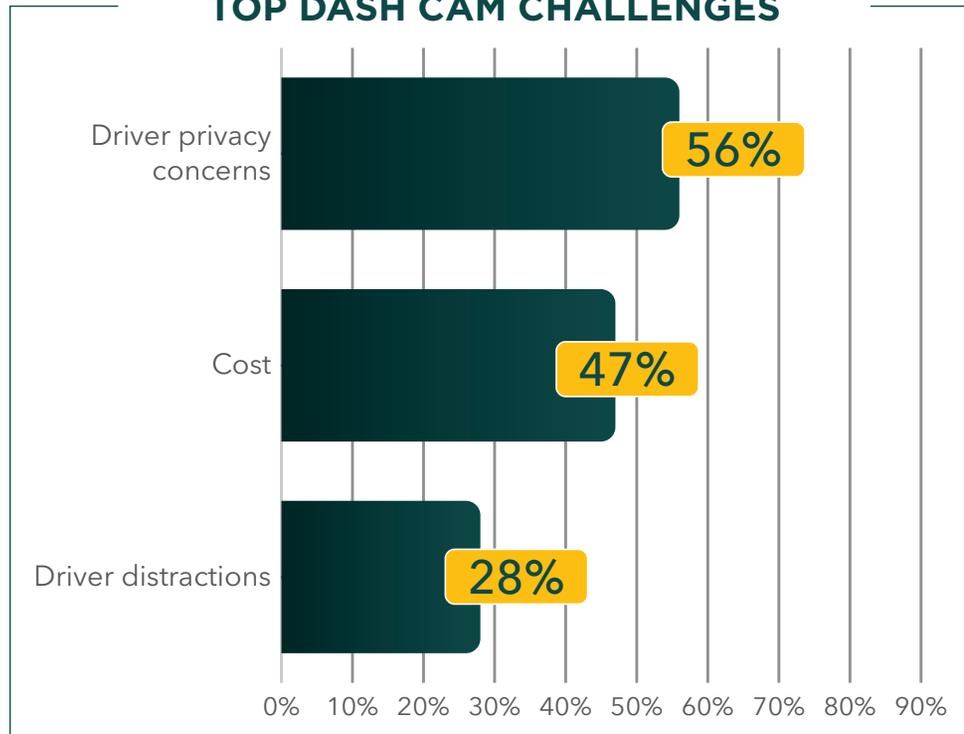
Carriers can improve driver acceptance by emphasizing benefits such as:

- ▶ Improved driver efficiency and reduced paperwork,
- ▶ Increased customer billing and driver payments for detention time, and
- ▶ Enhanced performance bonuses from telematics data.

# DASH CAM (VIDEO-EVENT RECORDERS)

Dash cam are perceived by many drivers as an invasion of their privacy. The additional costs can also be a significant barrier to adoption. However, carriers need to adopt proactive practices that reduce risks, such as driver distraction, and improve fleet safety. The top challenges with the respondents' percentages and experts' thoughts are below.

## TOP DASH CAM CHALLENGES



# WHAT DO OUR EXPERTS SAY?



## DRIVER PRIVACY (AND ACCEPTANCE) CONCERNS (56%)

Understandably, at the top of the challenges list is driver privacy, which is closely related to driver acceptance. Privacy is often the most significant contributor to a driver's lack of dash cam acceptance.

### Use facts

Start with presenting facts and current driver testimonials (if available).

Next, share that the passenger car driver is at fault in at least 70% of fatal truck-passenger-vehicle-involved crashes. Hence, the exoneration of the truck driver is a real possibility.

Also, compelling data comes from the April 2023 American Transportation Research Institute (ATRI) *Issues and Opportunities with Driver-Facing Cameras (DFC)* study, which found:

- ▶ **DFC footage helps exonerate commercial truck drivers in 49% of litigation cases and 52% of insurance claims where video footage was available.**
- ▶ Approval of DFCs was 87% higher when carriers used the video footage for safety programs, driver coaching, and training than when there was no proactive safety use.

The widespread use of dash cams across private fleets is also a positive indicator. The National Private Truck Council's 2022 Benchmarking Survey confirmed that among private fleets, many of which operate light- to medium-duty vehicles, 72% have adopted dash cam systems. Only 28% use road-facing cameras (RFCs), and 56% use road- and driver-facing cameras to improve drivers' skills and address risk. The result was that private fleets incurred 0.4 DOT recordable accidents per million miles in 2022, well below FMCSA's audit standard of 1.5.





## WHAT DO OUR EXPERTS SAY? (Cont.)

### Update the dash cam policy

Policy considerations to address driver privacy concerns include:

- Obtain written driver consent before collecting, storing, or using video clips or biometric data, such as using fingerprints, retinal scans, voice signatures, or facial recognition.
- Include how and when drivers will be recognized and rewarded.
- Identify and prioritize the focus behaviors (such as distracted or drowsy driving and seat belt use).
- Avoid excessive coaching for minor incidents.
- Record video clips for “x” seconds before and after a triggered event for coaching or legal defense and avoid continuous recording.
- Limit video access to safety personnel and secure video from unauthorized access.
- Provide initial and ongoing training of driver coaches on their approach to drivers and privacy.
- Refrain from monitoring drivers in real-time except in an emergency.
- Prohibit audio recording to avoid legal issues in dual-party consent states.

### Enhance the bonus and recognition program

Drivers care about improving their behavior and skills. Money in a driver’s paycheck and recognition tied to desired behavior changes are often effective. Incentive and recognition program criteria should be easily understood and perceived as fair.



## WHAT DO OUR EXPERTS SAY? (Cont.)

### COST (47%)

Dash cam video can help protect carriers during wrongful lawsuits and minimize settlements or verdicts. Relying on witness testimony is a gamble; **video is the best witness.**

The previously cited exoneration statistics provide an excellent starting point to counter the cost challenge. Even if you can't wholly exonerate a driver, video evidence may motivate a plaintiff to settle more quickly and for less than expected.

ATRI's 2021 study, *The Impact of Small Verdicts and Settlements on the Trucking Industry*, found a correlation between an alleged infraction in a lawsuit and payment size. In addition to the prospect of exoneration from the allegations in the chart, these unsafe behaviors are correctable with coaching from dash cam video clips.

### AVERAGE LITIGATION COSTS FOR INFRACTIONS DETECTABLE WITH DASHCAMS

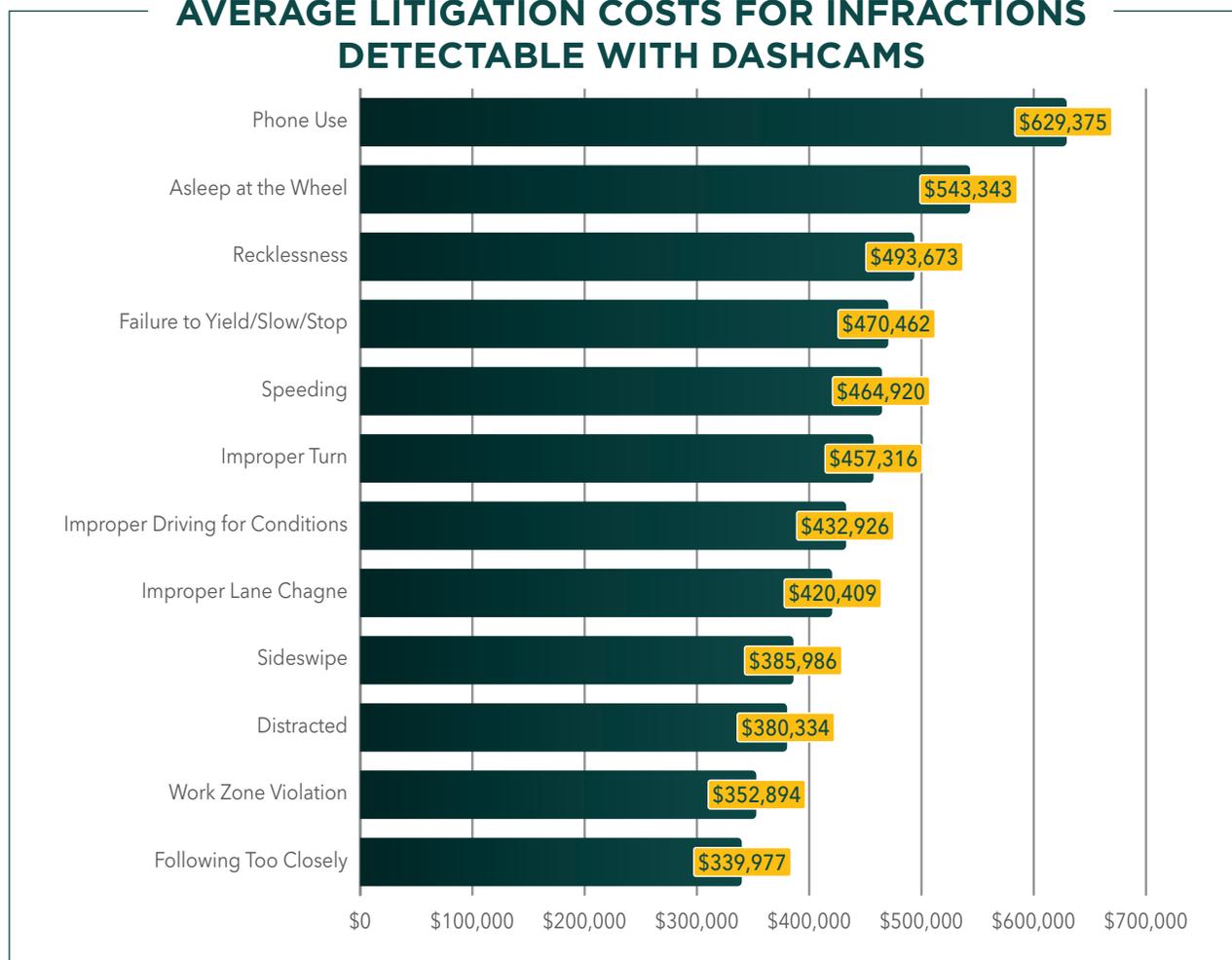


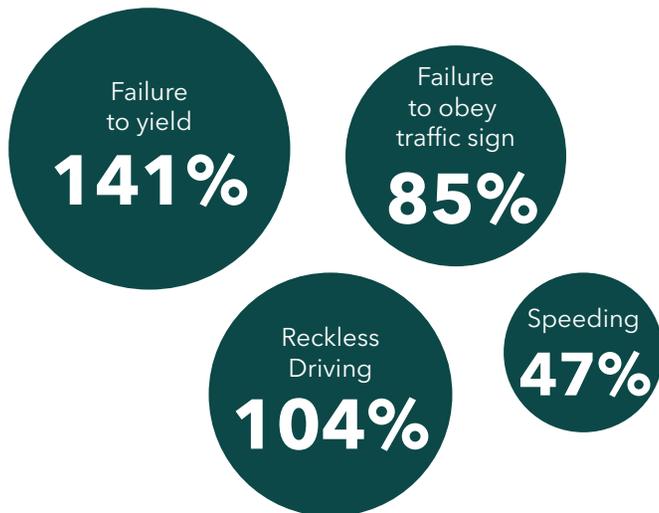
Chart from: *The Impact of Small Verdicts and Settlements on the Trucking Industry*. American Transportation Research Institute. November 2021



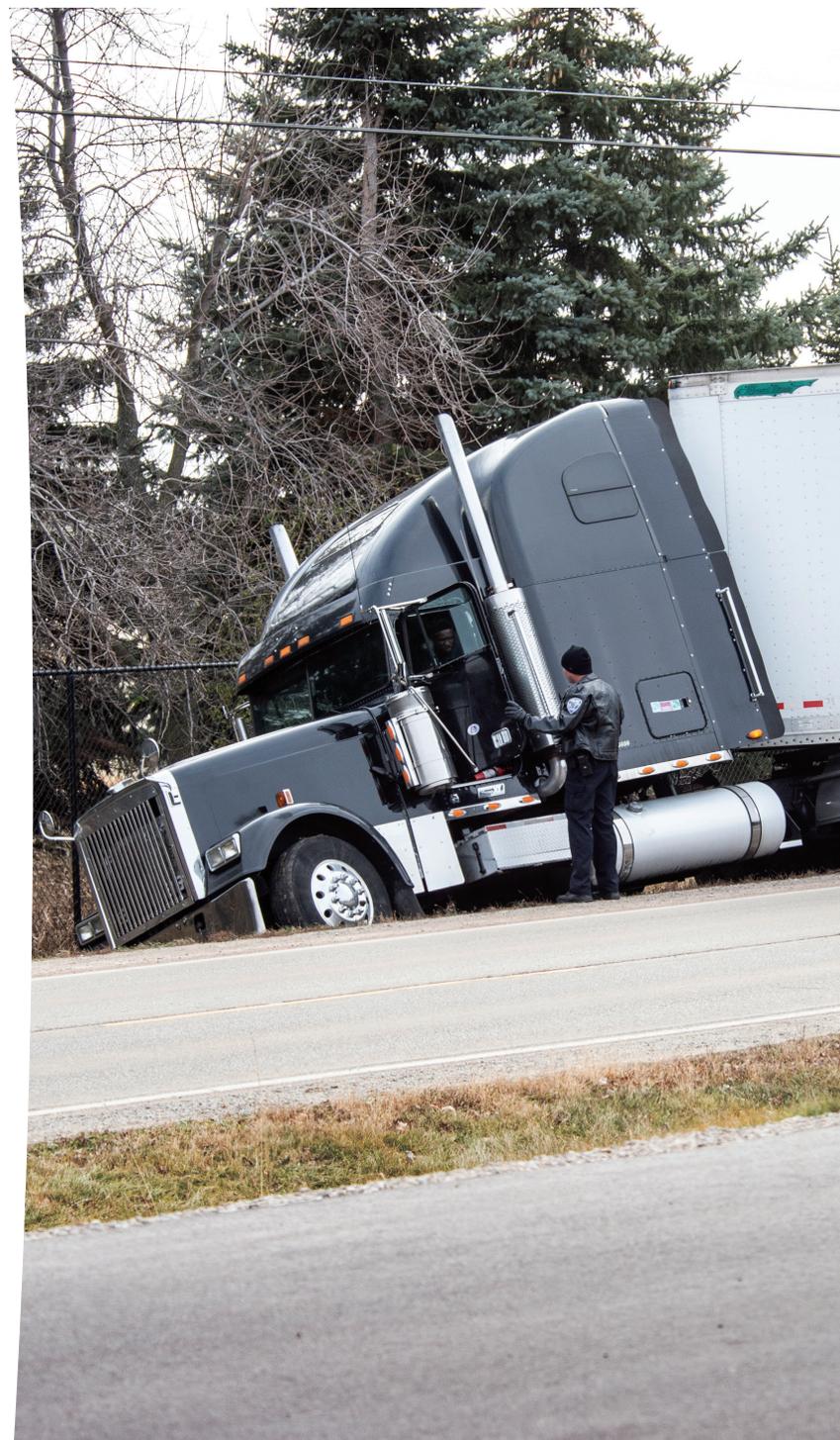
## WHAT DO OUR EXPERTS SAY? (Cont.)

ATRI's 2022 update of the *Predicting Truck Crash Involvement study* determined the increased probability of a DOT crash for drivers with violations or convictions for certain unsafe driving acts. Examples of violations from events detectable with cameras and which result in an increased chance of a DOT crash include:

### INCREASED CHANCE OF A DOT CRASH



Coaching drivers to eliminate unsafe behaviors leads to lower costs due to fewer citations, fewer serious crashes, and a stronger defense against claims of negligence.





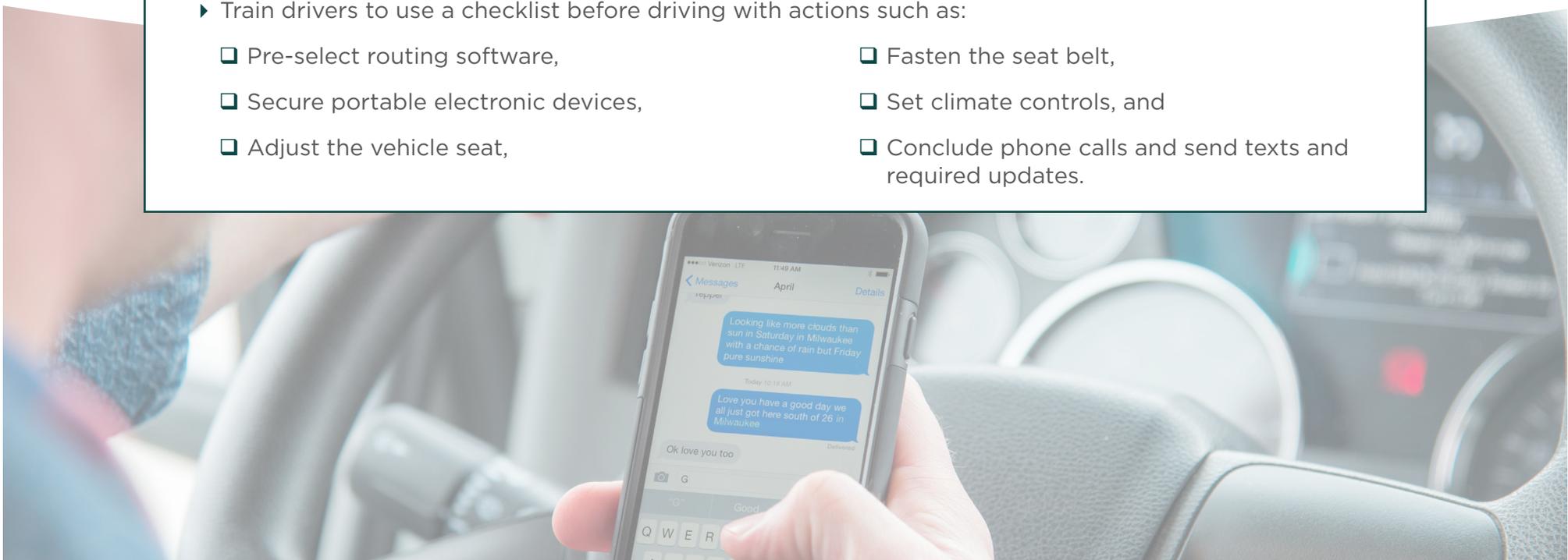
## WHAT DO OUR EXPERTS SAY? (Cont.)

### DRIVER DISTRACTIONS (28%)

From the *Predicting Truck Crash Involvement study*, the probability of having a DOT-recordable crash was 62% greater if a truck driver was convicted of careless or inattentive driving. Coaching to reduce distracted driving is an effective countermeasure.

Also, implement safe driving policy points such as:

- ▶ Prohibit handheld cellphone use unless safely parked (already illegal for interstate CMV drivers).
- ▶ Office employees must not call drivers unless the vehicle is parked, as shown by vehicle tracking.
- ▶ Train drivers to use a checklist before driving with actions such as:
  - Pre-select routing software,
  - Secure portable electronic devices,
  - Adjust the vehicle seat,
  - Fasten the seat belt,
  - Set climate controls, and
  - Conclude phone calls and send texts and required updates.

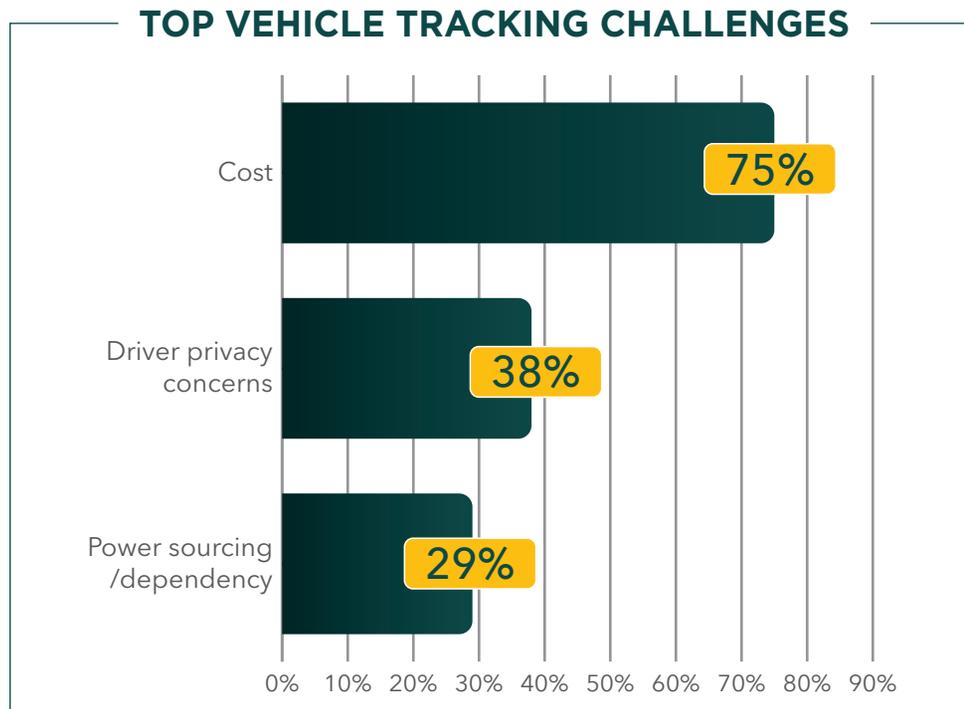


# VEHICLE TRACKING

Driver turnover, lack of qualified drivers, and inflation have eroded margins for many carriers. The annual inflation rate for the U. S. was 3.7% for the 12 months that ended September 30, 2023, per the Bureau of Labor Statistics, which followed 2022 closing out at 8.0%.

Vehicle tracking can provide actionable data to run a fleet more efficiently and overcome these challenges to improve profitability.

The top challenges with the respondents' percentages and experts' thoughts are below.



# WHAT DO OUR EXPERTS SAY?



## COST (75%)

For fleets that do not have the use of an ELD's GPS capabilities for vehicle tracking, a complete list of benefits to offset the challenge of cost includes not only the Top 3 cited but also the following:

- ▶ **Automated reporting** — Fuel tax (IFTA) and vehicle registration reporting (IRP) if applicable to vehicles due to interstate travel and vehicle weight or axle counts.
- ▶ **Behavior correction** — Detecting unsafe driving (such as excessive speed or hard brakes).
- ▶ **Vehicle recovery** — Knowing the location of abandoned or out-of-service vehicles can avoid the cost of towing or storage, additional damage, or continued lack of use.
- ▶ **Driver safety** — Having the precise vehicle location if a driver has not reported in or there otherwise are concerns about their wellbeing, may save the driver's life.

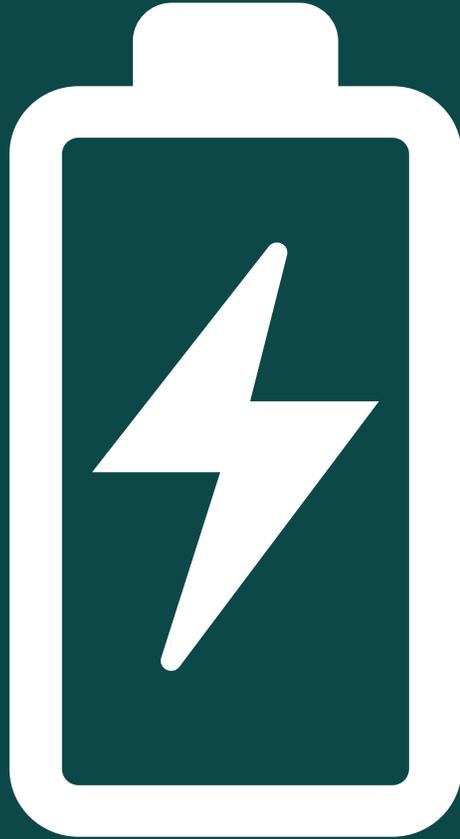
## DRIVER PRIVACY CONCERNS (38%)

Employers must protect a driver's privacy if subject to tracking in company vehicles.

A vehicle-tracking privacy policy should have a few key points, such as:

- ❑ Limit location information access to safety managers/directors; do not share with family and "friends."
- ❑ Do not excessively monitor or interrogate drivers about minor infractions.
- ❑ Define proper and prohibited vehicle use to avoid misunderstandings.





## WHAT DO OUR EXPERTS SAY? (Cont.)

### POWER SOURCING/DEPENDENCY (29%)

Keeping a vehicle tracking unit powered can be problematic, especially if the tracker is on a trailing or otherwise unpowered asset. Below are actions to take if power concerns arise:

- ▶ Verify that the correct connector/harness for the on-board diagnostics (OBD) port is in use.
- ▶ Ensure the wiring is correct and properly grounded.
- ▶ Confirm that the ignition key is turned to the ACC or IGNITION position and check that the GPS power cable is tight.
- ▶ Check the fuse(s) for the GPS receiver and transmitting unit.
- ▶ Lastly, some tracking units have solar panels to keep the battery charged, so make sure those connections are tight and waterproof.

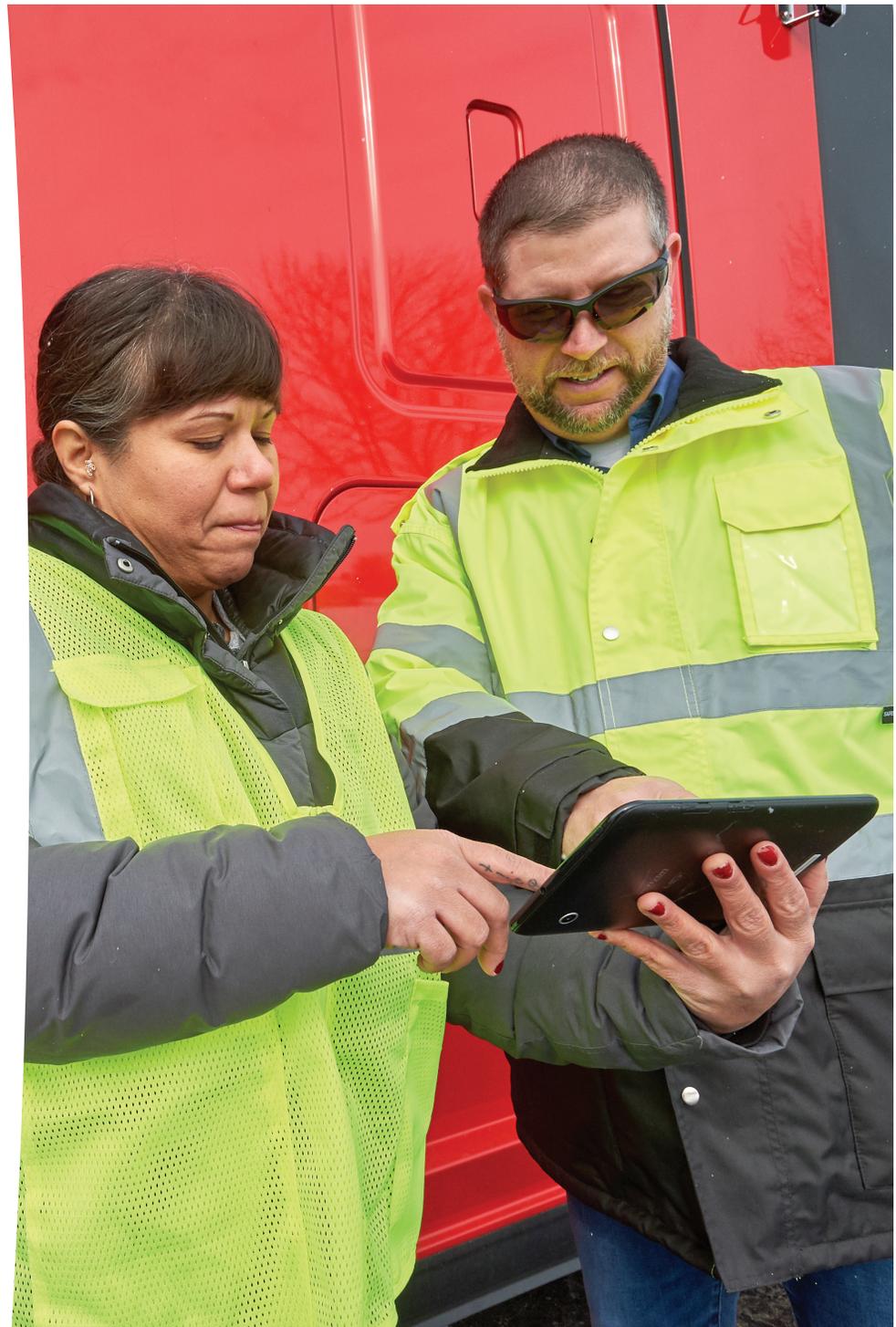
# CONCLUSION

A driver shortage, above-normal inflation, and increased regulation contribute to decreased profits. Carriers need to counter these challenges with in-cab technology to survive.

Fleet managers have embraced technology at an increasing rate, but to maximize the return on investment, they must:

- ▶ Help drivers and the office team see the benefits of in-cab technology and understand how to use it to gain efficiencies while protecting privacy;
- ▶ Achieve cost reductions by reducing risk, retaining drivers, and implementing efficient practices and processes to serve customers safely and compliantly; and
- ▶ Understand how to address technology malfunctions to minimize downtime while staying compliant.

Consider compliance, risk management, and operational efficiency as the three legs of a stool essential to a carrier's success. All three must be present to provide stability for the organization to thrive. In-cab technology strengthens each of the three legs.



# ABOUT THE AUTHOR

Mark Schedler joined J. J. Keller in June 2016, with 25 years of transportation experience in operations, logistics, and finance. As a Senior Editor in the Transportation Publishing Department of Editorial Resources, he is responsible for developing and updating content for existing materials. He is the Editor of the *Everyday Transportation Safety Management* publication, as well as contributes to new products and supporting customer solutions.

Mark's primary areas of expertise include transportation operations and safety, driver retention, passenger-carrier regulations, as well as the use of dashcams (video-event recorders) for coaching to reduce unsafe behaviors. Mark also presents to live audiences and helps customers with their regulatory issues.



## ABOUT J. J. KELLER CENTER FOR MARKET INSIGHTS

The J. J. Keller Center for Market Insights is the collaborative research arm of J. J. Keller & Associates, Inc. The center originated in 2019 with a focus on sharing, with the public, trends and insights from an abundance of safety and compliance data gathered by J. J. Keller over decades serving more than 700,000 customers across the United States. Through historical data, new proprietary studies and partnerships with reputable, research-focused third-party organizations, the center publishes ongoing reports to spur discussion and advancements in safe, respectful workplaces, job sites and highways. To contact the J. J. Keller Center for Market Insights, contact [sbaranczyk@jjkeller.com](mailto:sbaranczyk@jjkeller.com).



J. J. Keller®  
**COMPLIANCE  
NETWORK**

Copyright 2024 J. J. Keller & Associates, Inc.

Government regulations change frequently; therefore, J. J. Keller cannot assume responsibility or be held liable for any losses associated with omissions, errors or misprinting in this publication. This publication is designed to provide reasonably accurate information and is distributed with the understanding that J. J. Keller is not engaged in rendering legal, accounting, or other professional services. If legal or other expert advice is required, the services of such a professional should be sought.