

Automatic Emergency Braking and Other Electronic Safety Systems

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Thank You for Joining Us!

- This webcast will cover ...
- A regulatory overviewBest practices in compliance
- A case study in implementation
- Question & Answer
- You will be muted during the event.
- Please use the Q&A feature to send in questions. We'll try to answer them during the Q&A period if they are not covered in the presentation.

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• The slides and recording will be posted within 7 days at: www.jjkeller.com/nptcinfo

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Meet Your Presenters







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 Tom Bray
 Tom Moore, CTP

 Sr. Industry Business Advisor
 Executive Vice President

 J. J. Keller & Associates, Inc.
 National Private Truck Council



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Required Electronic Safety Systems

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Required by NHTSA/FMCSA

- Antilock braking system (ABS)
 - Wheel sensors and processor detect wheel lock Brakes that are locked are "modulated" to prevent skidding and loss of control
 - Required on:

 - Tractors as of March 1, 1997
 Air-brake trailers as of March 1, 1998
 - Malfunction warning lights required
 - Tractor dash (dash malfunction light for trailer required as of March 1, 2001)
 Left rear corner of the trailer

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• If malfunctioning, a violation but not an out-of-service violation

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Required by NHTSA

- Electronic stability control (ECS)
- Pitch, roll, and yaw sensors determine when vehicle is becoming unstable • Engine defueled and smart braking applications to reduce speed
- Required on:
 - Most tractors as of August 1, 2017
- Currently no violation if it is not functioning (not in FMCSA's regulations currently)

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Required by FMCSA

- Electronic logging devices (ELDs)
 - Required for drivers that must log and are not covered by one of the ELD
 - exemptions
 - ELD must track driver's compliance with the HOS regulations • Technical standards found in Appendix A to Subpart B of Part 395
 - · Most system have a lot of non-required options, including:
 - Instant communications/HOS updates
 Driver performance tracking, including:

 - Hard braking
 Idle time
 Fuel mileage

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Proposals on the Way

- Automatic emergency braking (NHTSA/FMCSA)
 - · Slows the vehicle if the driver has not reacted to a hazard in the vehicle's path
 - Has been on NHTSA's radar since 2015
 - Active petition at NHTSA to standardize and/or required AEB



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Also on the Radar

- Under 21 pilot program vehicle requirements:
 - Active collision mitigation (AEB)
 - Forward facing camera
 - Automatic or autoshift transmission
 - Speed limiter (65 mph) when under throttle or adaptive cruise control
 Adaptive cruise cannot allow the vehicle to exceed 65 mph
- This shows that FMCSA is aware of the other electronic safety systems that are available

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Also on the Radar

• Vehicle-to-vehicle (V2V)

- Communications protocol that allows two "smart" vehicles to determine how to avoid a collision
- Allows platooning of vehicles
- Currently under development and in use in pilot programs



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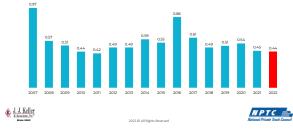
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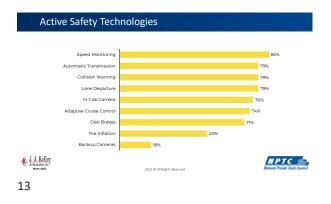
Compliance Tom Moore, CTP

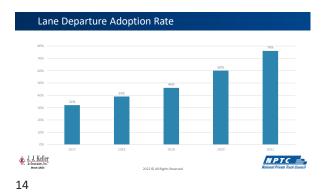
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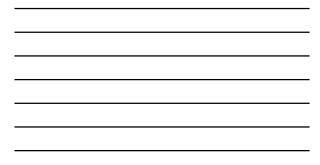


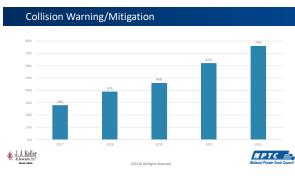




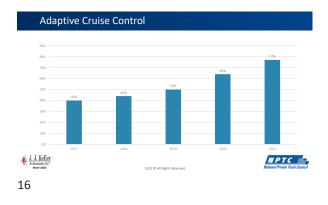


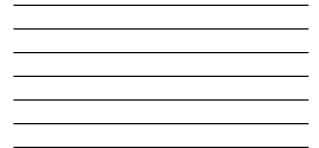






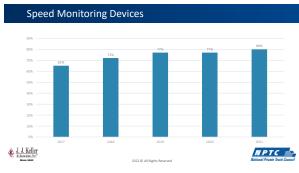




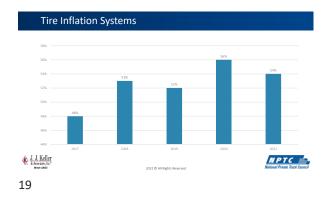


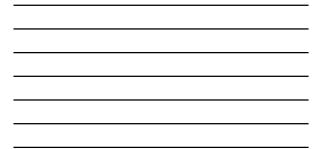
In-Cab Cameras





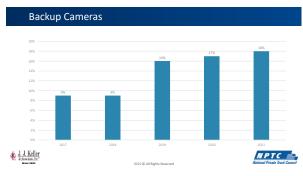




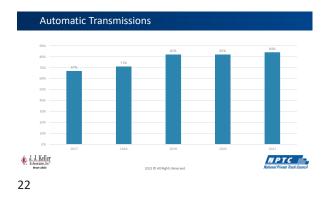


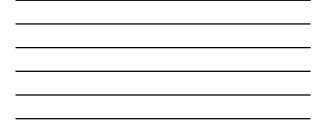
Disk Brakes











Implementing Active Technology

- Safety culture
- Communication, education and training
- Data aggregation protocols
- Revisit metrics to determine relevance
- Review safety policies
- Re-evaluate staff responsibilities
- Coaching

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Technology Drives Behavior Changes

- Behavior changes are critical to ongoing success
- Coaching and training are the first and most important steps
- Having meaningful, actionable and timely data is essential
- Unfortunately, some just will not learn and take the coaching
- Once you have coached multiple times then they should not be surprised when corrective action is taken

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Technology Drives Accountability

- Certain behaviors are unacceptable, but the industry never had tools to prove
- Video, speed, engine telematics give us the evidence we need to hold people accountable
- People improve because they know data exists
- This flows over to all safety protocols, training, rules, and procedures

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Coaching

- Enables learning and development (and thus improvement) after an incident
- Involves an interview process to discuss the coachable event
- · Focuses on behavior and observations to improve driver safety
- Helps reinforce desired behavior and action



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Exciting Opportunities & Challenges

- Opportunity understand risk exposure like never before
- Amazing new opportunities to identify and correct unsafe behaviors
- Challenge avoid technology overload
- Challenge is developing management systems to
 - Ensure technology is used fairly and consistently,
 - Prioritize information,
 - · Process data actionable reports, and
 - Ensure focused improvement most important action items.

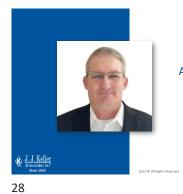


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A Fleet's Perspective
Tim Eckhardt, CTP





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Current DTI Equipment Safety Technology

| Feature | EOY 2021 | Year Complete |
|--|----------------------------|---------------|
| Anti-Lock Brakes Tractor | 100% | |
| Anti-Lock Brakes Trailer | 100% | |
| Disc Brakes Trailer | 100% | |
| Disc Brakes Tractor | 65% | 2025 |
| Roll Stability | 100% | |
| Tire Inflation System Trailers | 100% | |
| Dual Facing Cameras | 100% | |
| Bluetooth Radio Systems | 95% | 2023 |
| Steering Wheel Controls | 70% | 2025 |
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Current DTI Equipment Safety Technology

| Feature | | EOY 2021 | Year Complete |
|--|------------------------|----------|---------------|
| Adapt Cruise/Follow Dist. [| Detect | 77% | 2025 |
| Forward Collision Mitigatic | n 35 mph | 36% | NA |
| Forward Collision Mitigatic | on 50 mph | 41% | 2027 |
| Multi-Lane Detection Brak | ing | 36% | 2028 |
| Highway Departure Braking | g | 29% | 2028 |
| Right BlindSpotter Detection | on | 39% | 2027 |
| Lane Departure Warning | | 77% | 2025 |
| Road Sign Recogn/Display | Dash | 54% | 2027 |
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Future Equipment Safety Technology

- Steering Assist
- 28 Tractors in the fleet with this
- technology • Lane Centering
- Lane Keep/Departure
- Pedestrian Detection • New and possibly limited avail 2022
- Side Mirror Cameras
 - New and possibly limited avail 2022

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• Driver State Monitoring

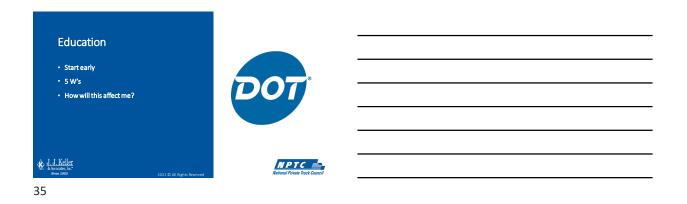
- Lots of discussion and debate on having this as a factory option in trucks, but expect some limited availability 2022
- Backup Cameras

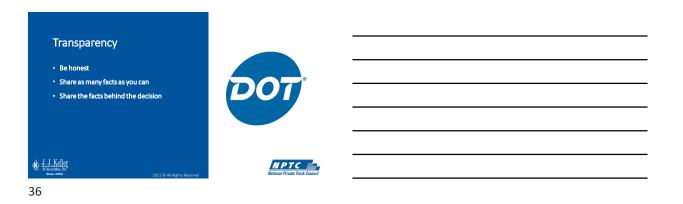
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Testing in Fall 2022





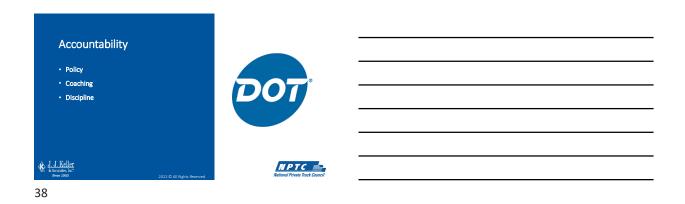












Implementing Active Safety Technology

- Start the communication early. Plant the seed
- Communicate the Why?
- Be honest and as transparent as you can
- Share strategic and long-term plans
- Obtain driver involvement in the testing
- Communicate the rollout and policies
- Update driver handbook quarterly with new policies

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Coaching

- Culture & Coaching
- Develop your coaching bench strength
- Driver touches make coaching easier
- Use videos of event if available
- Track and follow up on progress
- Have a limit on amount of coaching before it leads to discipline



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Mistakes/Pitfalls

- Mistakes we have made
 Mis-communication
 - Bait & Switch
 - Camera Placement
 - Management acceptance & understanding of the technology



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Question and Answer Session







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