FMCSA-Sponsored
Onboard Monitoring System
Field Operational Test Program

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FMCSA Operational Test

- FMCSA is interested in testing onboard monitoring systems for commercial drivers
  - Evaluate effectiveness, acceptance, and impact
  - Collect naturalistic data for future research
  - Great opportunity for a carrier to try out integrated safety systems
- Research team is actively seeking carriers to participate in the operational test program
  - Evaluating carriers, terminals, and driving operations
Drive Vision Pro

Forward Collision Warning
Lane Departure Warning
Electronic Logbooks
Electronic Hours of Service
Driver Behavior Monitoring
Inattentive, Drowsy, and Aggressive Driver Detection
Video View and In-Cab Components
In-Cab Feedback

Driving Page
Headway
Basic trip info

Performance Events
Wear and tear, costs
Data only

Safety Events
Safety maneuvers
Video and data

Collision Avoidance Warnings
Imminent crash warnings
Video and Data

Sync’d with office server
Drive Vision Pro Data Collection

- Safety Epochs
  - 10 Hz video and sensor data surrounding trigger event (-15 to +5 seconds)
  - Triggers:
    Probable collision (spiked acceleration)
    Hard braking
    Large lateral acceleration
    Swerve
    Forward collision avoidance
    Lane departure warning message
    Driver initiated epoch capture

- Example Videos
Drive Vision Pro Data Collection (cont’d)

- Performance Events
  - Event details
    - Location, magnitude, duration, mins, maxs
  - Triggers:
    - Warm up Idle
    - Shut down Idle
    - Operational Idle
    - Speeding Event
    - Engine Overspeed
    - Hard Braking
    - Grade Speed
    - Short Headway
    - Rapid Acceleration
    - Hard Corner
    - Coasting Event
### Drive Vision Pro Data Collection (cont’d)

- **Trip Summary Data**
  - Summary statistics for each drive:

<table>
<thead>
<tr>
<th>Fuel Mileage Driving</th>
<th>Time and Miles on Cruise Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel Mileage Total</td>
<td>Time and Miles in Top Gear, Top Gear–1</td>
</tr>
<tr>
<td>Fuel Spent Idling</td>
<td>Time and Miles in RPM Bands</td>
</tr>
<tr>
<td>Idle Time</td>
<td>Time and Miles in Speed Bands</td>
</tr>
<tr>
<td>Lane Change Turn Signal Usage</td>
<td>Time and Miles in Headway Ranges</td>
</tr>
<tr>
<td>Seat Belt Usage (if available)</td>
<td>Speed Relative to Traffic Flow Bands</td>
</tr>
<tr>
<td>Time and Miles Driving</td>
<td>Speed Relative to Max Grade Speed</td>
</tr>
<tr>
<td>Time and Number of Backups</td>
<td>Time and Miles by Gear</td>
</tr>
<tr>
<td>Engine Brake Usage</td>
<td></td>
</tr>
</tbody>
</table>
Safety Data Flow

- Raw Event
- Transecurity Data Center
  - Analysts validate event
  - Note conditions
  - Narrative
  - Causal factors
  - Responsibility
  - Is this a coachable event?
  - Colorado, Virginia
- Validated Video
  - Events & Data
- Fleet Management
  - Driver Comparison
  - Event Review
  - Safety Trend Analysis
  - Feedback/Coaching
  - Accountability
- Driver Feedback & Coaching
DriveMetrix Pro

Provides Information, Not Data

Track Group/Driver Performance

Accountability and Workflow

Identify the Safest Drivers

Identify the Least Safe Drivers

High Value Coaching
Initial Pilot Results

Carrier A

Carrier C

Carrier B

Incident Rate Per 10,000 Miles

Phase of Testing

Pre-Baseline  Feedback  Post-Baseline

Pre-Baseline  Feedback  Post-Baseline

Pre-Baseline  Feedback  Post-Baseline

Valid FCW

Valid LDW
Effective OBMS Components

- Information – Not Data
  - Reduce operational friction
  - Focuses on exceptions and lowest performers

- Assess Data in Context
  - Results are accurate and fair (exposure)
  - Results are validated – video is critical
  - Causation is understood – video is critical

- Both Immediate and Offline Feedback
  - Adjusts driving styles in real time
  - Allow for driver self-correction
  - Provides high value coaching content
DriveVision Pro Product Questions

- Before I talk about the Onboard Monitoring System Field Operational Test, we’ll take 5 minutes of questions about the DriveVision Pro product.
- You may enter questions in the box at the lower left of the screen.
- Questions will be taken in the order they are received.
On-Board Monitoring System FOT

- Program is underway
  - Installing on first fleet, pilot testing on the second
- Currently seeking an additional long haul carrier to participate
  - Approximately 100 trucks
  - Ready to proceed immediately
- Equipment and services fees are paid for by FMCSA through the test program for 18 months
- Carriers are responsible for installations
  - 3-4 hours per truck
  - Installation training and validation software are provided free of charge
Research Program Setup

- Commercial Demonstration
  - 270 trucks from 3 separate carriers
  - Fleet operates DriveVision Pro in event-based collection mode for 18 months

- Research Study 1
  - University of Washington assesses the impact of the commercial system on Fleet’s safety, cost, and driver behavior
  - Drivers fill out questionnaires with their opinions
  - Drivers can opt in or out

- Research Study 2
  - Video and sensor data are collected continuously while the vehicle is in motion
  - Drivers can opt in or out
Next Steps

- Verify compatibility of Technology with fleet trucks
- Identify terminals/operations to be included
  - Numbers of trucks
  - System rollout planning
  - Effective safety and operations management
- Pilot installation
  - Operational truck and driver
  - Cooperative driver – feedback
  - 2–3 weeks of data collection and verification
- Gain final participation commitment
After Go-Ahead

- Transecurity to hire local support technician(s)
- Schedule installations
- Hold driver informational meeting to explain informed consent, drivers rights, compensation
- 18 month system operation and data collection
- Analysis of effectiveness by University of Washington
- Final report published through FMCSA
How You Can Participate…

- Easy! Just send an email to Mike Mollenhauer at the address below with the following information and I’ll get back to you:
  - Name of Fleet
  - Number of Trucks
  - Potential Locations to be Involved
  - Type of Driving Operation(s)
  - Safety Systems Currently in Use (if any)
  - Your Contact Information

Mike’s Email Address: MMollenhauer@vtti.vt.edu
Contact Information

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