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Field Study of Heavy-Vehicle Crash Avoidance Systems

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NHTSA
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Overview

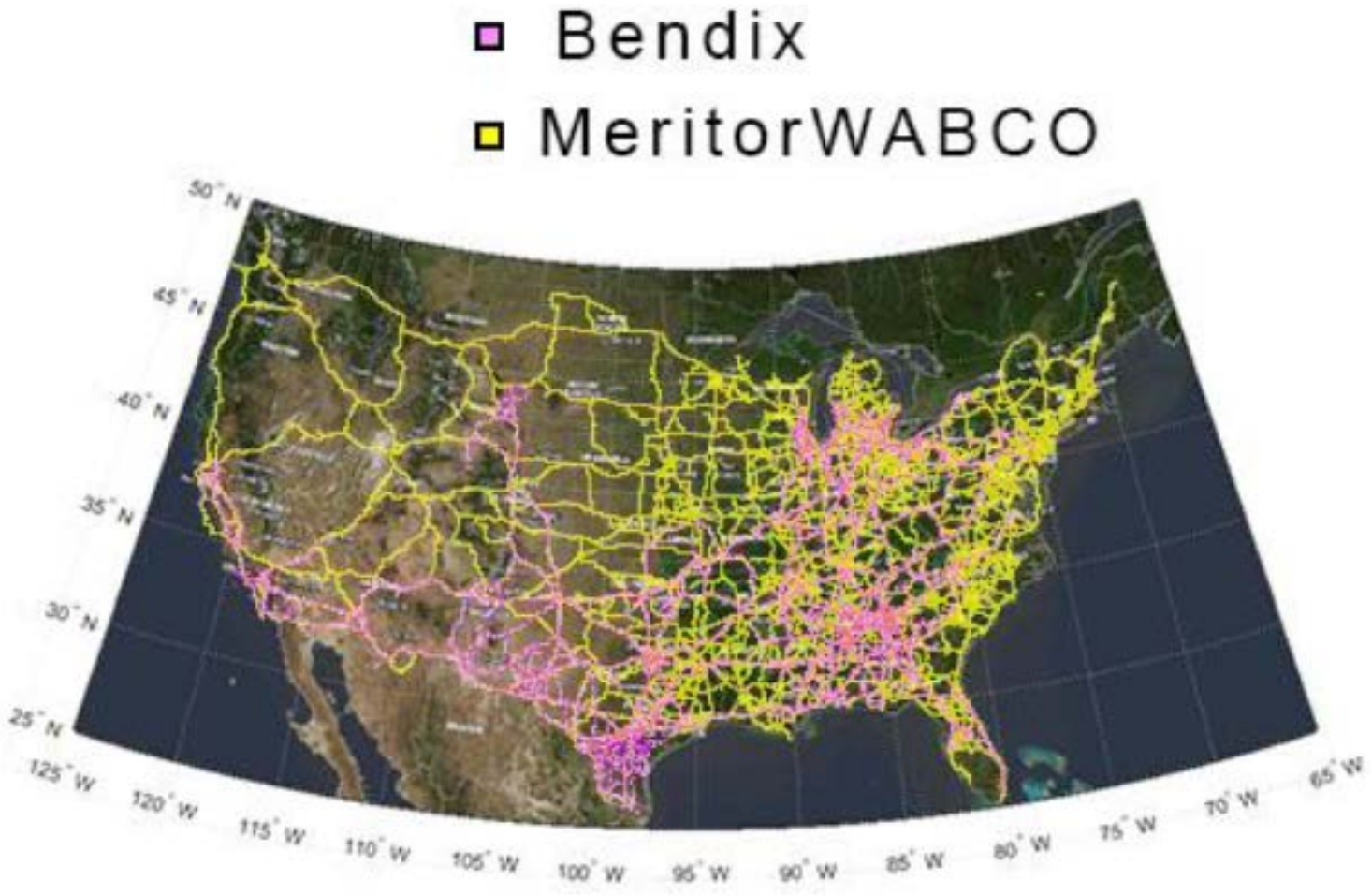
- Background
- Locations of Trucks in Study
- Data Collection
- Videos of Safety Critical Events
- Next Steps

Background

- Field Operational Test (FOT) on Heavy Vehicle Collision Avoidance and Mitigation Systems
- Conducted by Virginia Tech Transportation Institute (VTTI)
  - 7 Small to Medium Sized Fleets Participating.
  - 150 - Class 8 Tractors Instrumented (including video data) for Approximately 1 year.
  - Collision Avoidance Systems (CAS) Tested:
    - Automatic Emergency Braking/Forward Collision Warning (AEB/FCW)
    - Lane Departure Warning (LDW)

CAS	Bendix	Meritor WABCO	Total
AEB/FCW	54/54	96/96	150/150
LDW	6/54	80/96	86/150

Locations of Trucks in Study



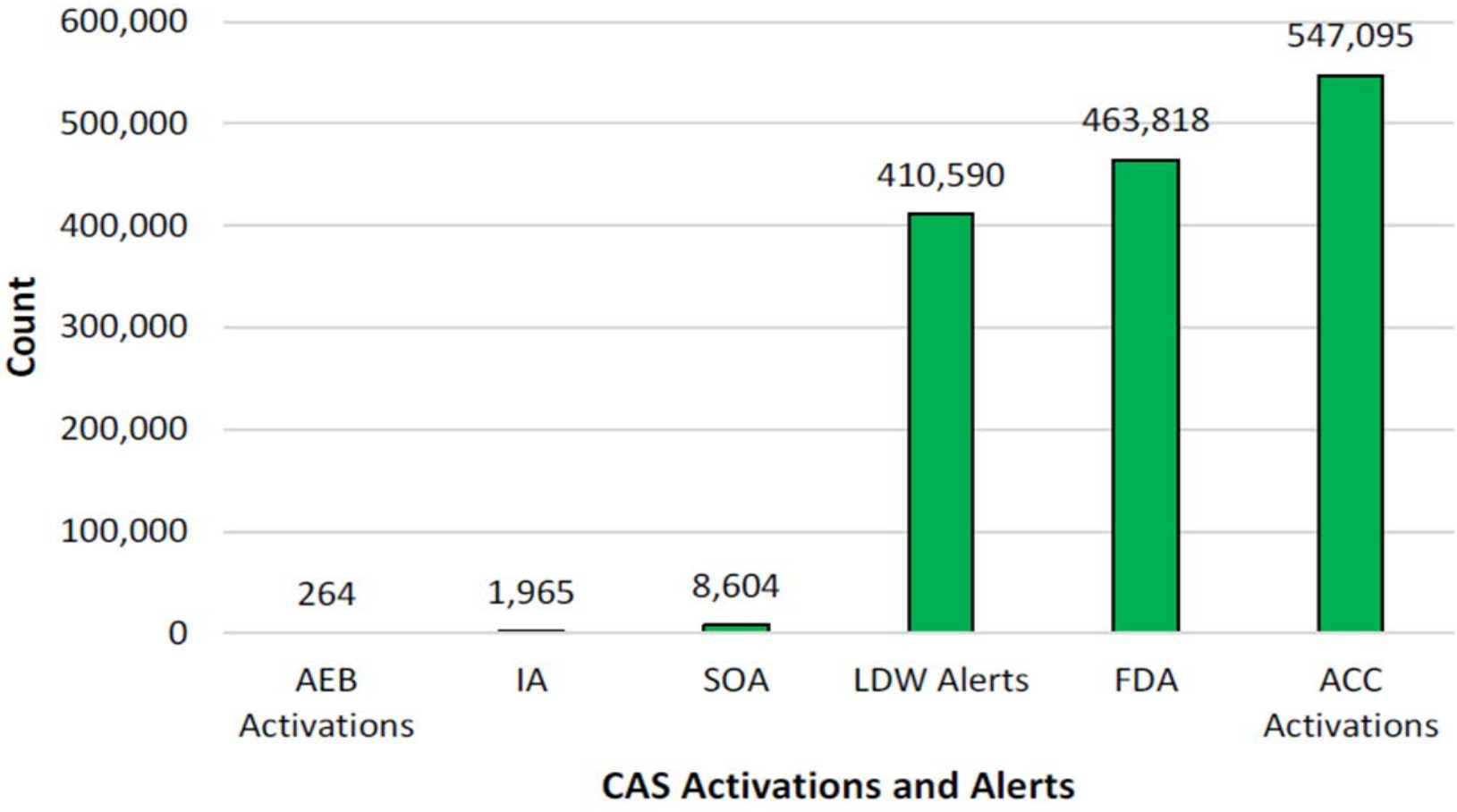
Data Collection

- Types of Alerts
  - Automatic Emergency Braking (AEB)
  - Impact Alert (IA)
  - Stopped Object Alert (SOA)
  - Following Distance Alert (FDA)
  - Lane Departure Warning (LDW)
  - Study Measure – Adaptive Cruise Control (ACC) Activation

Data collected from FOT:

- *3.2 Million Miles of Driving*
- *109,000 Hours of Driving*

Alerts and System Activations



Videos of Safety Critical Events

- AEB Activations were rare events – drivers in the study received them at a rate of 0.005/hour.
- Study investigated a sample of 6,000 safety critical events including all AEB activations.

Naturalistic Video Examples:

1. Braking Lead Vehicle
2. Turning Lead Vehicle
3. Truck in Passing Maneuver
4. Lane Change by Vehicle Ahead
5. Multiple Lane Change by Vehicle Ahead
6. Truck Passing a Turning Vehicle Ahead
7. Hard Braking Event - Distraction

Braking Lead Vehicle

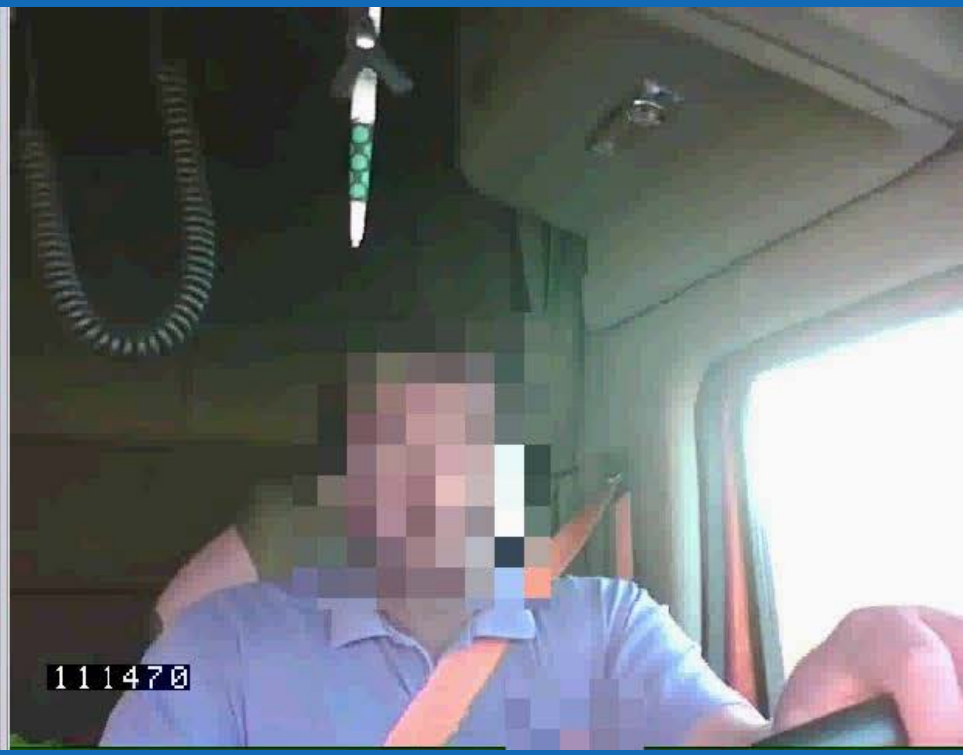
Turning Lead Vehicle

Truck in Passing Maneuver

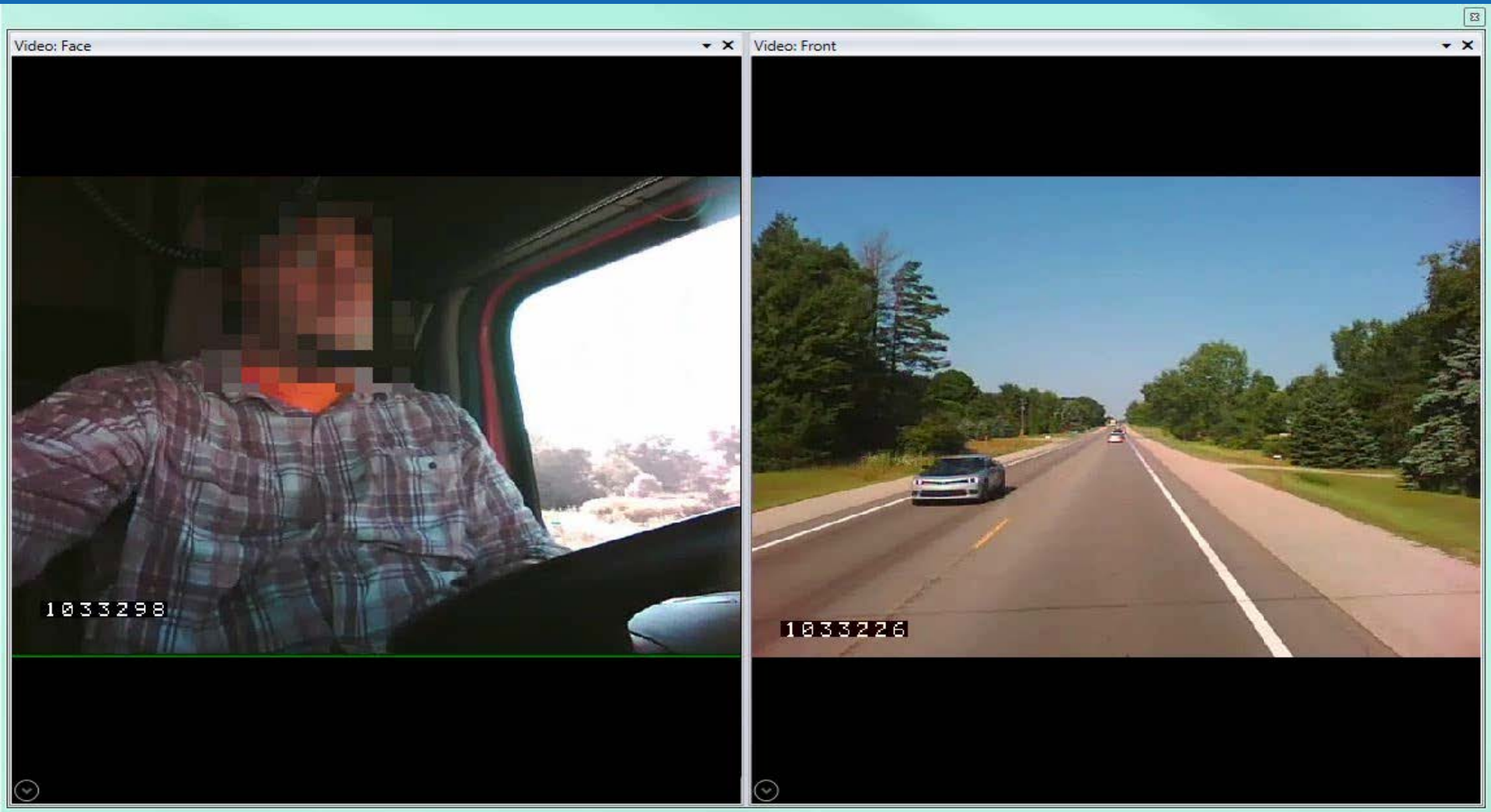
Lane Change by Vehicle Ahead

Multiple Lane Change by Vehicle Ahead

Truck Passing a Turning Vehicle Ahead



Hard Braking Event - Distraction



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Next Steps

- NHTSA is continuing research with a follow on study, Field Study of Newer Generation Heavy Vehicle AEB Systems.
  - Awarded to VTTI - Project kickoff was in November 2016.
  - 2+ Year naturalistic study of AEB systems installed in 150 trucks.
  - Examine real-world performance of newest generation of:
    - Bendix® Wingman® Fusion™
    - Detroit Assurance™ 4.0
    - Meritor WABCO OnGuardACTIVE™
- Final Report available now at www.nhtsa.gov:
  - *DOT HS 812 280 - Field Study of Heavy-Vehicle Crash Avoidance Systems.*

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