Commercial Vehicle Driver Acceptance Clinics

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ITS Workshop on Connected Vehicles
Moving from Research towards Implementation
Chicago, IL
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Outline

- Heavy Truck V2V Safety Research
- Connected Commercial Vehicle Project
- Commercial Vehicle Driver Acceptance Clinics (CV DAC)
**Objective:** Resolve technical issues necessary for deployment of Vehicle-to-Vehicle (V2V) systems on commercial vehicles (CV) in support of NHTSA 2013/14 decisions.

**Connected Commercial Vehicle Team Led by Battelle (CCV-IT)**

- Develop V2V safety applications on a heavy truck platform
- Build Heavy Truck Tractors with integrated V2V (3 - Freightliner Class 8 Tractors) for:
  - CV Driver Acceptance Clinics
  - Participation in Model Deployment
  - Safety Application performance testing by U.S. DOT
Connected Commercial Vehicle Project Team

AUTOMOTIVE EVENTS
Integrated Truck Architecture

- **Access Point**
- **Ethernet Switch**
- **DVI**
- **CAN Gateway**
- **Truck J1939**
- **CAN**
- **DGPS**
- **DENSO Wireless Safety Unit 1.5 (WSU)**
- **WSU Primary**
- **WSU Secondary**
- **DAS**
- **DGPS Receiver**
- **CAN Gateway**
- **Driver Vehicle Interface**
- **U.S. Department of Transportation**
Integrated Heavy Truck Installations
CV Driver Acceptance Clinics (CV DAC)

- Evaluate Driver Acceptance of V2V Applications in Heavy Trucks
  - Surveys and direct observation of driver responses to warnings
  - Recruited drivers with valid CDL from local fleets and independents
  - In-depth interviews of drivers
  - Participants are paid for their time
- Coordinated with the Light Vehicle Clinics and Volpe Independent Evaluator

Ohio - July 10-26, 2012
Transportation Research Center, Inc.
East Liberty, Ohio

California - August 22-23, 2012
Former Alameda Naval Air Station
CV DAC Scenarios

1. IMA: Stopped HV Enters Intersection with RV Approaching
2. FCW: HV Encounters Stopped RV in Same Lane
3. EEBL: HV Approaches Decelerating RV with an Obstructing Vehicle
4. BSW/LCW: RV in the Blind Zone
5. BSW/LCW: HV Attempts a Lane Change, RV Is in the Blind Zone
Intersection Movement Assist (IMA)

Truck pulls away from a stop sign
Forward Collision Warning (FCW)

Stopped car ahead

Caution

WARNING
Emergency Electronic Brake Lights (EEBL)

Hidden car suddenly brakes

Caution
Hard Braking Ahead

WARNING
Blind Spot/Lane Change Warning (BSW/LCW)

Car in the blind spot

Car in the blind spot, HV’s turn signal engaged
CV DAC Preliminary Demographics

- 112 participants total
  - 64 in Ohio
  - 48 in California
- 61 one-on-one in-depth interviews
- 109 male, 3 female participants
- Experience level ranged from recent trainee through corporate training directors.
CV DAC Preliminary Results

Acceptance was nearly universal

- From the written questionnaires:
  - “Must have”
  - “The technology was excellent.”
  - “Very, very good thing. No unexpected rear end [crash].”

- From the interviews:
  - “At last” or “About time”
  - “Audio [warning] more important than visual [warning]”
    - “Want eyes out the window”
    - “Want informative sounds, not just beeps”
  - “Want different sensitivity for city, rural, fog, ice”
CV DAC Preliminary Results (Cont.)

- **Cautions From Truck Drivers**
  - “If it’s annoying, it will be disconnected” [by truck drivers].
  - “Experienced drivers will use their mirrors and not the BSW”
  - “This will become a crutch for light vehicle drivers”

- **Suggestions From Truck Drivers**
  - Warn of motorcycles between the lanes in California
  - Deal with the daily fog in the Bay Area
  - “Look around the corners of stacked containers at the Port of Oakland”
Contact Information

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Thank You for Your Attention!

Questions?