



UNITED STATES
DEPARTMENT OF TRANSPORTATION

Commercial Vehicle Driver Acceptance Clinics

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**National Highway Traffic Safety
Administration**

ITS Workshop on Connected Vehicles
Moving from Research towards Implementation

Chicago, IL

September 25, 2012

Outline

- Heavy Truck V2V Safety Research
- Connected Commercial Vehicle Project
- Commercial Vehicle Driver Acceptance Clinics (CV DAC)



Heavy Truck V2V Safety Research Overview

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



Battelle

The Business of Innovation



Mercedes-Benz

Research & Development North America, Inc.



UMTRI

Daimler Trucks North America

MERITOR WABCO

DENSO North America

AUTOMOTIVE EVENTS

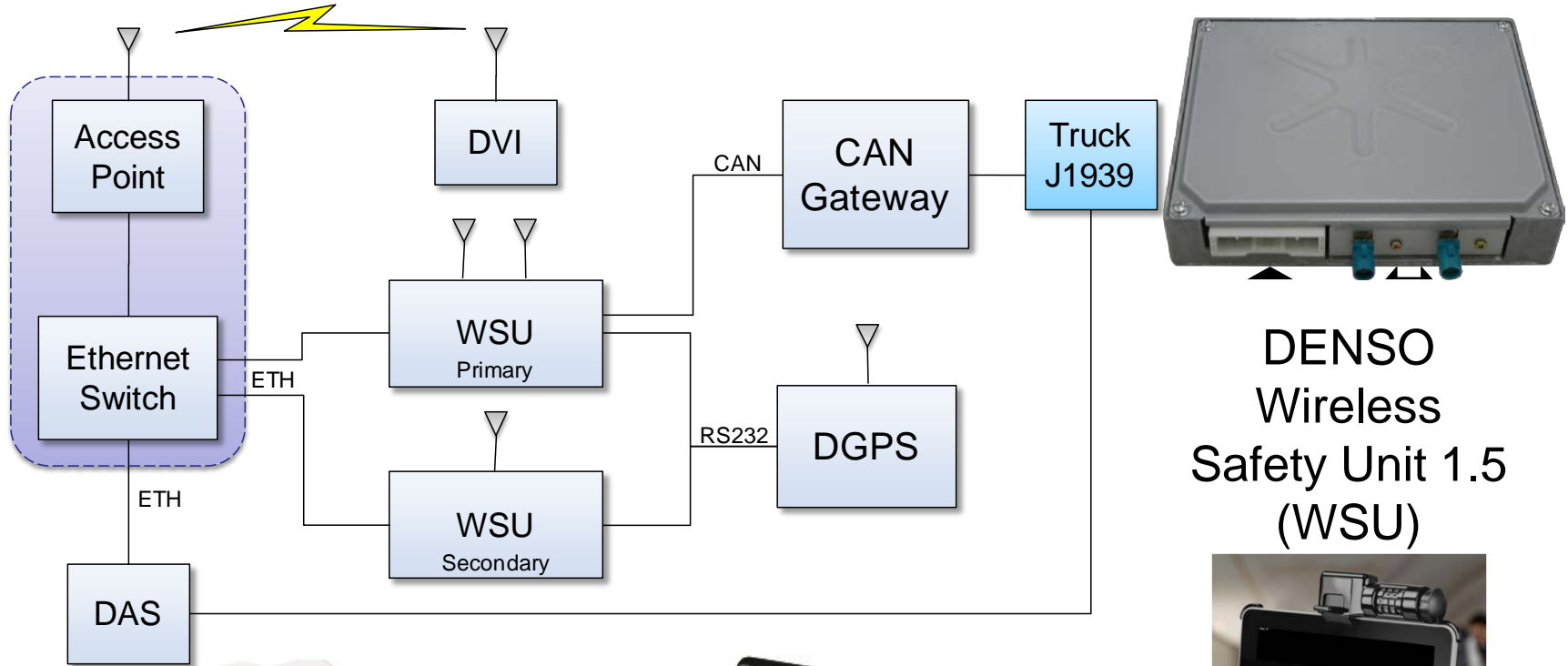


TRANSPORTATION
RESEARCH CENTER INC.



U.S. Department of Transportation

Integrated Truck Architecture



DENSO
Wireless
Safety Unit 1.5
(WSU)



DGPS Receiver



CAN Gateway



Driver Vehicle Interface

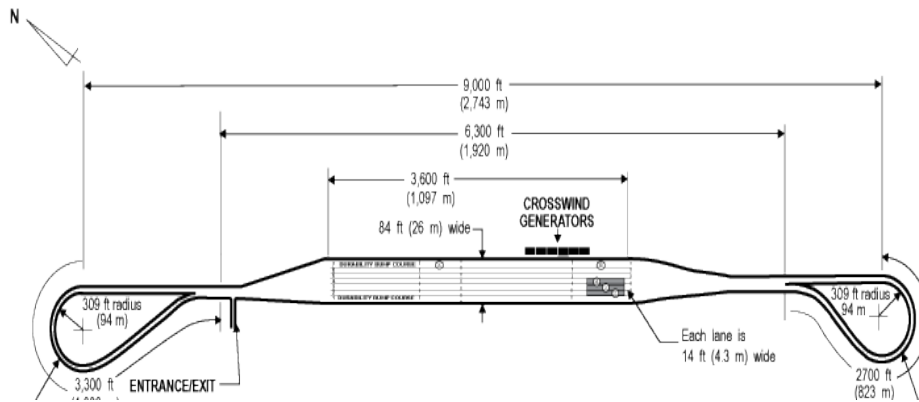


Integrated Heavy Truck Installations



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**



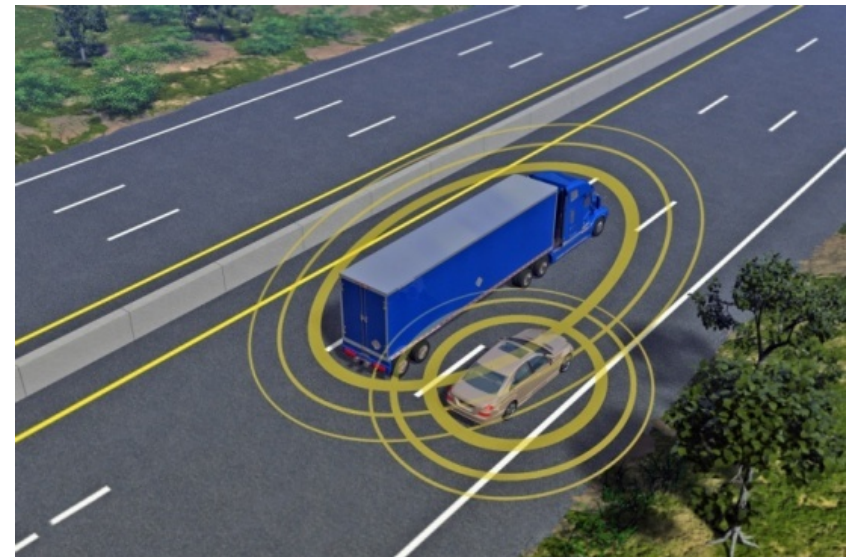
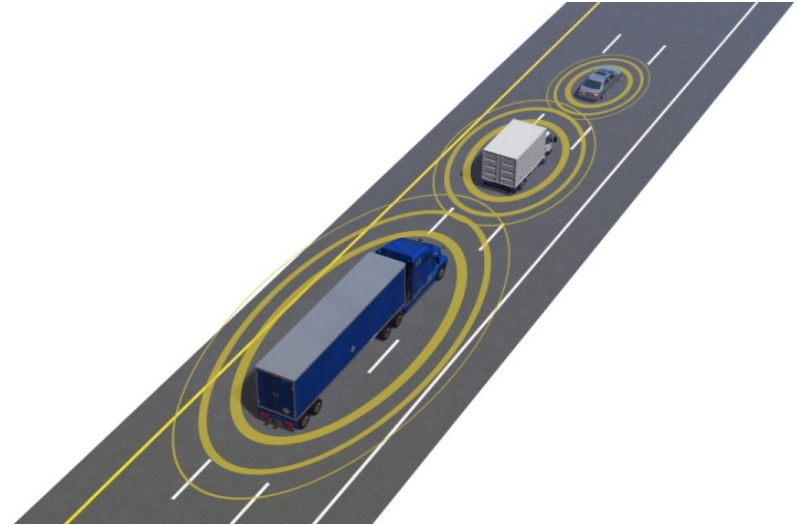
California - August 22-23, 2012

Former Alameda Naval Air Station



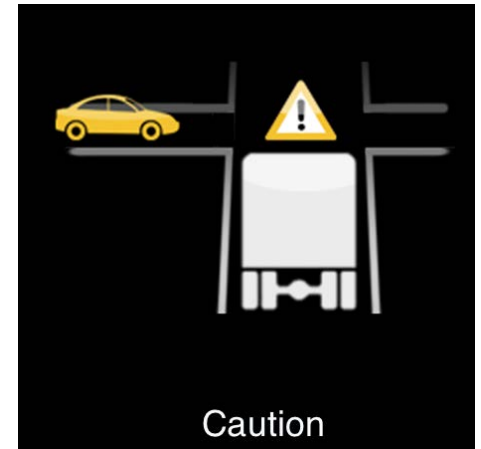
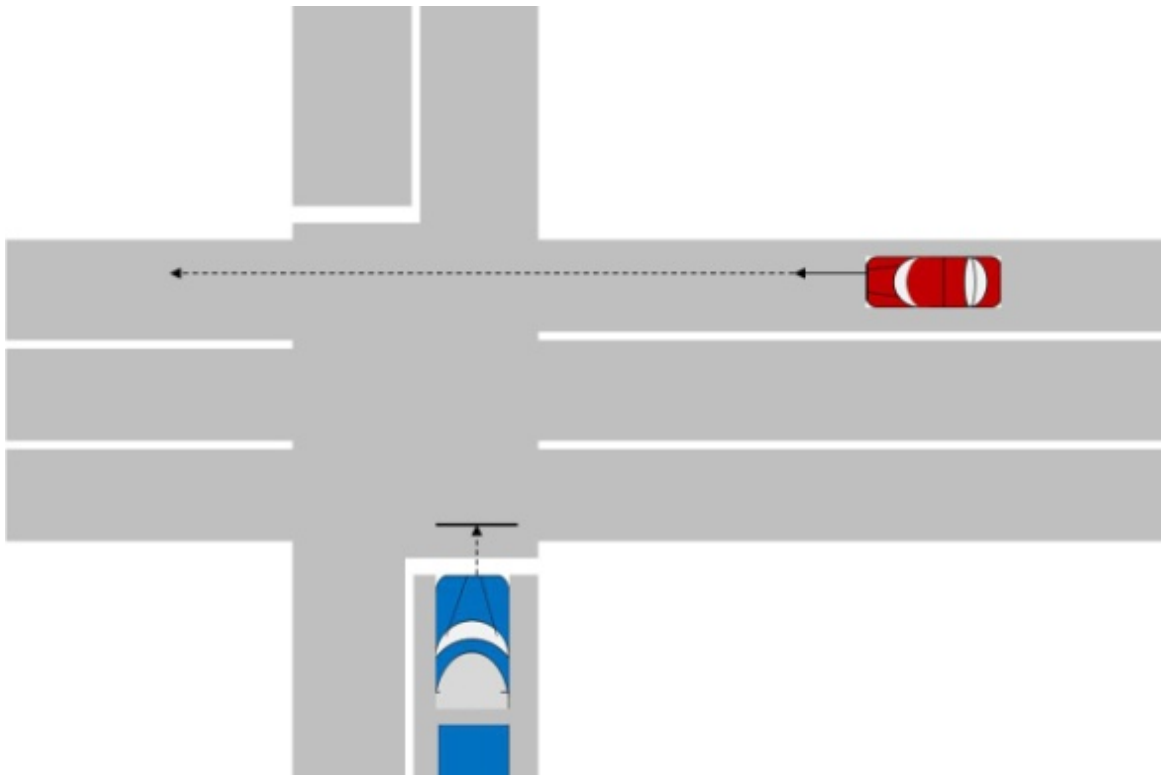
CV DAC Scenarios

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



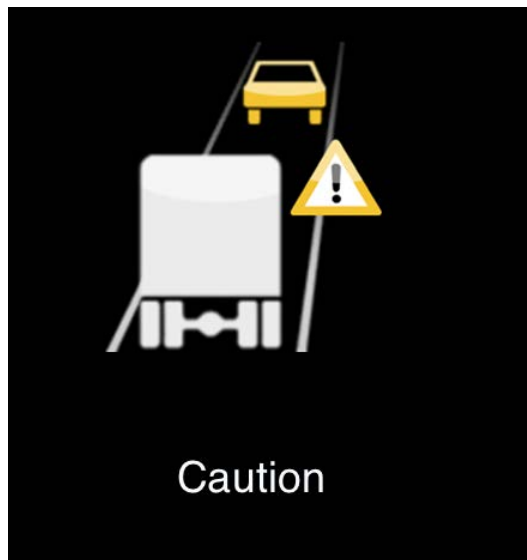
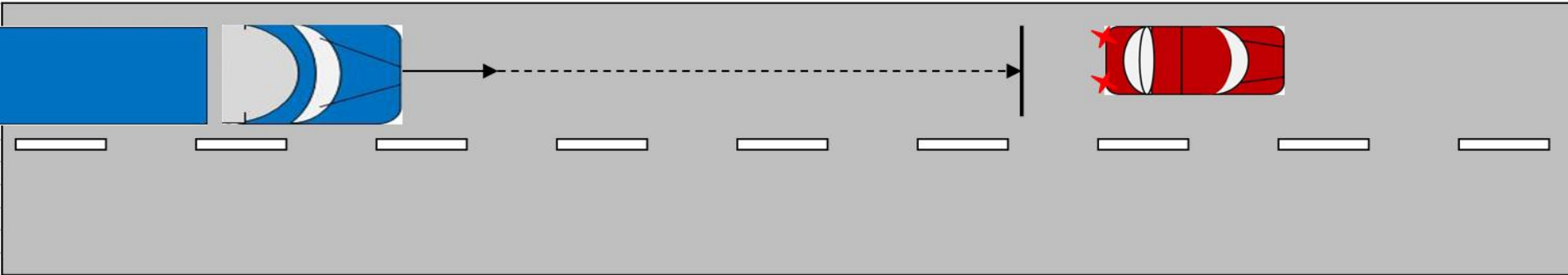
Intersection Movement Assist (IMA)

Truck pulls away from a stop sign



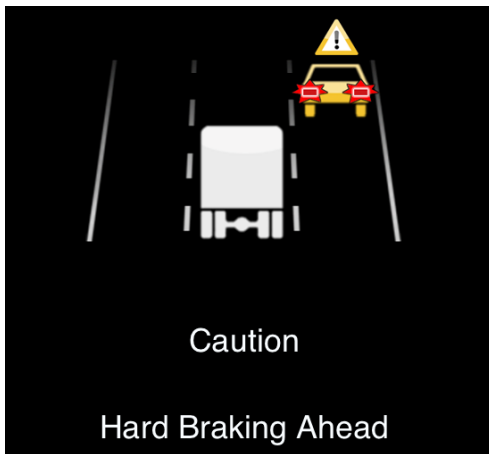
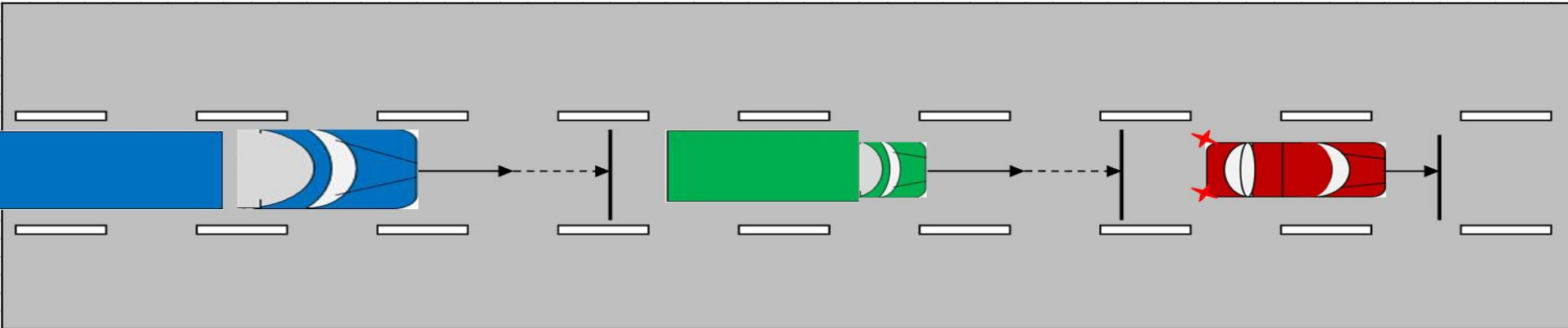
Forward Collision Warning (FCW)

Stopped car ahead



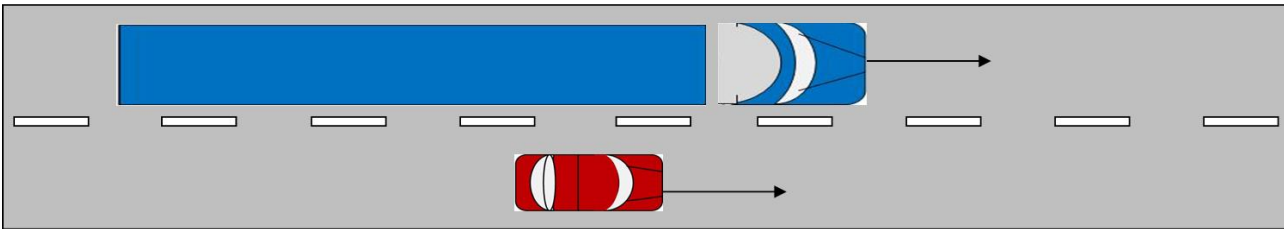
Emergency Electronic Brake Lights (EEBL)

Hidden car suddenly brakes

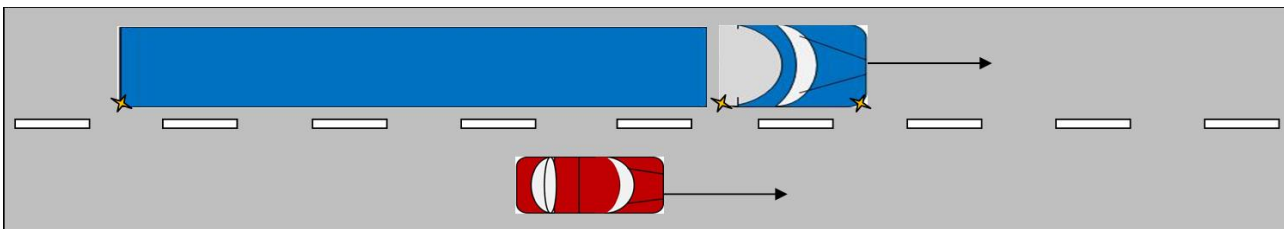


Blind Spot/Lane Change Warning (BSW/LCW)

Car in the blind spot

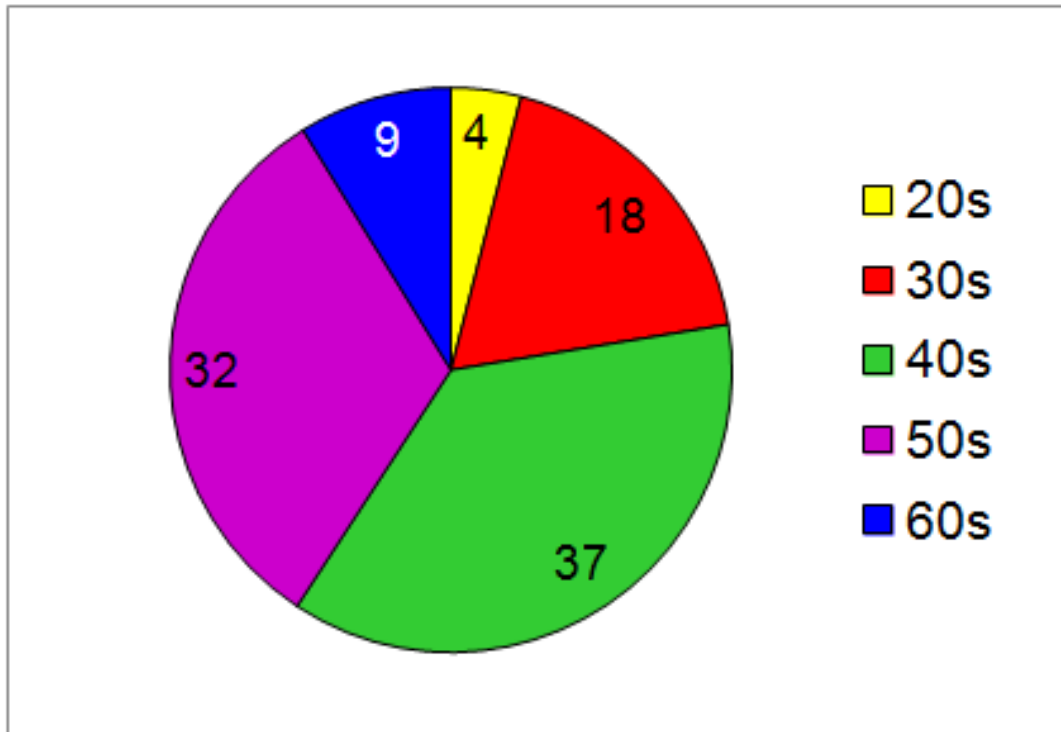


Car in the blind spot, HV's turn signal engaged



CV DAC Preliminary Demographics

Percentage of Participants in Each Age Group



- 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?