NHTSA

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Field Study of Light Vehicle Advanced Driving Assistance System (ADAS)

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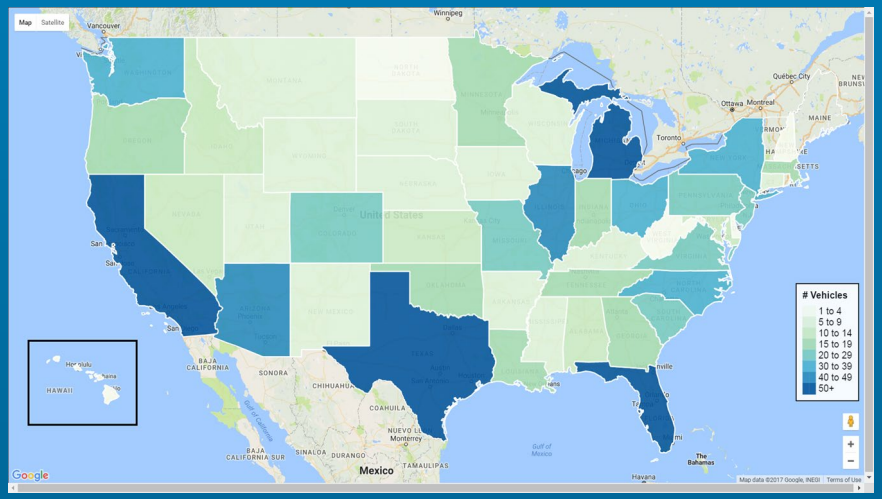
Outline

- Project Background & Objectives
- Methodology for Data Collection
- Definition of Automatic Emergency Braking (AEB) Events
- Overview of Results
- Q & A

Project Background & Objectives

- Rapid proliferation of ADAS technologies
- Evaluate emerging ADAS technologies in real world driving
  - Focus on AEB system performance
- Performed by University of Michigan Transportation Research Institution (UMTRI)
  - In collaboration with General Motors (GM)

Methodology for Data Collection

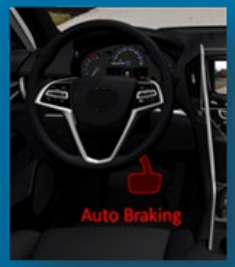


Data Acquisition System

- Utilized vehicle telematics
- Across 46 States
- Drivers opted in
  - Used own vehicles
  - No experimenter interaction
- Event data sent to OnStar Center
- GM provided de-identified AEB data to UMTRI for analysis
  - Vehicle safety performance
  - Drivers' adaption

Definition of AEB

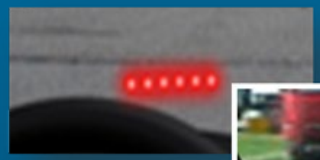
- **Collision Imminent Braking (CIB)**
  - Imminent front-end collision detected
  - Driver has not applied brakes
  - System automatically applies brakes
- **Dynamic Braking Support (DBS)**
  - Imminent front-end collision detected
  - Driver brakes hard
  - DBS provides boost to driver braking
- **Both CIB & DBS**
  - CIB initiated
  - Driver intervened/override CIB
  - DBS provides a boost to the driver
- **AEB – Either CIB or DBS or Both**

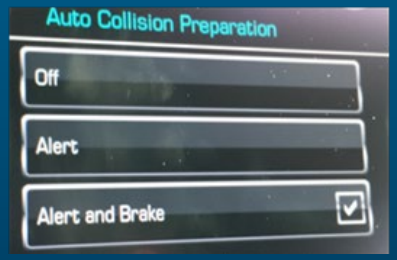


Long/Mid-Range Radar

Camera

2 Short Range Radars





Basic Statistics on AEB Events

Total Vehicles	1,021
Total Trips	1,106,210
Total Miles of Driving	11,891,341
# CIB Events	258
# DBS Events	962
# CIB with DBS Events	17
Total All Events	1,237

Drivers' Setting Choices

Front Auto Braking	
Setting	Percent of Driving Time
Off	1.7
Alert Only	1.9
Alert + Brake	96.4

Forward Collision Alert/Adaptive Cruise Control	
Setting	Percent of Driving Time
Near	27.4
Medium	27.5
Far	45.1

Majority of drivers employed AEB/default setting

About half of driving time 'Far' /default setting selected

Far Setting = maximum following distance

AEB & DBS Events Distribution

Vehicle Speed and Event Duration

Study Crash Statistics

- 8 Automatic Collision Notification (ACN) events collected
  - 3 side impacts (no CIB/DBS)
  - 3 rear impacts (no CIB/DBS)
  - 2 frontal impacts (CIB/DBS unknown)

Conclusion

1. Onboard data collection from production vehicles is a viable study approach
   - ✓ Can successfully produce large-scale data acquisition and analysis of ADAS system performance and driver behavior
2. Public-Private Partnerships are of high value for real-world vehicle safety studies

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