

Industry and Government: ACAT

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Presentation Outline

- Background information
- Program objectives
- ACAT teams
- Initial program activities

Program Background

- ACAT = “Advanced Crash Avoidance Technologies”
- The main goal of the ACAT program is to determine the safety impact of emerging technologies that are intended to assist drivers in avoiding crashes.
- The program is limited to “emerging & foreseeable” advanced technologies rather than either those already in production or just barely in the concept phase.
- The RFA for the ACAT Program was issued in the Summer of 2006 and awarded in the Fall of 2006.

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Program Objectives

- Objective 1 - Utilize a “Safety Impact Methodology” (SIM) to evaluate the ability of advanced technology applications to solve specific motor vehicle safety problems.
- Objective 2 - Demonstrate how the results of objective tests can be used by the SIM to establish the safety impact of a real system.

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ACAT Team 1: DRI-Honda

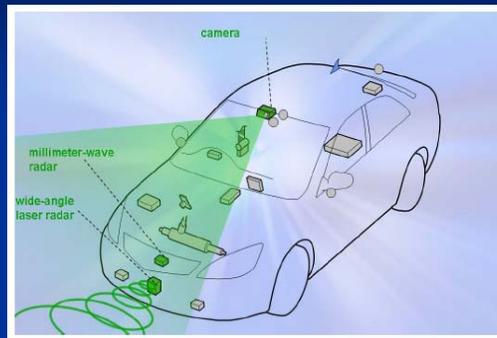
Dynamic Research, Inc.



- Honda R&D Co., Ltd. And Dynamic Research Inc.
- Total Cooperative Agreement Value is \$2 Million
- Scheduled time to completion is 24 months
- Technology to be evaluated: Advanced-Collision Mitigation Braking System (A-CMBS). The A-CMBS automatically predicts impending collisions, warns the driver and applies braking in order to reduce the effects of an impact.

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ACAT Team 1: DRI-Honda (con't)



- A-CMBS consists of
 - Forward-looking sensors
 - Driver warnings
 - Automatic braking

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ACAT Team 1: DRI-Honda (con't)

- SIM tool for the DRI-Honda team
 - Modify existing tool for the ACAT project
 - Components include:
 - fatality analysis
 - crash avoidance simulation
 - crash sequence simulation
 - automatic accident reconstruction
 - driver behavior modeling
 - Public and private crash databases will be analyzed to attain information in building the SIM such as the Fatality Analysis Reporting System (FARS).

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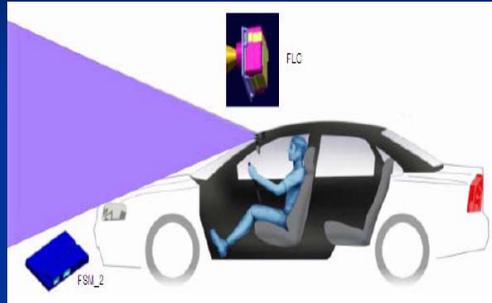
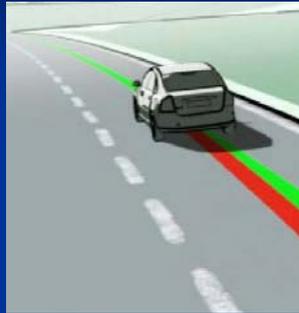
ACAT Team 2: Volvo-Ford-UMTRI



- Volvo Car Corporation, Ford Motor Company and the University of Michigan Transportation Research Institute
- Total Cooperative Agreement Value is \$1.9 Million
- Scheduled time to completion is 24 months
- Technology to be evaluated: Driver Alert, Lane Departure Warning and Emergency Lane Assist

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ACAT Team 2: Volvo-Ford-UMTRI (con't)



- The integrated unsafe lane departure warning system consists of:
 - Driver Alert (DA)
 - Lane Departure Warning (LDW)
 - Emergency Lane Assist (ELA)

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ACAT Team 2: Volvo-Ford-UMTRI (con't)

- SIM tool for the Volvo-Ford-UMTRI team
 - Develop a new SIM tool with computational modeling and simulation of conflict and imminent crash scenarios.
 - Mine relevant naturalistic driving data and national crash databases such as General Estimates System (GES) and Crashworthiness Data System (CDS) for inputs to SIM.
 - Object tests will be conducted on the test track and in a driving simulator to provide inputs to the SIM.

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ACAT Team 3: GM-VTTI



- General Motors Corporation and Virginia Tech Transportation Institute
- Total Cooperative Agreement Value is \$2 Million
- Scheduled time to completion is 30 months
- Technology to be evaluated: A Next-Generation Backing-Collision countermeasure that provides levels of automated control to avoid backing collisions (with emphasis on pedestrian detection).

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ACAT Team 3: GM-VTTI (con't)



- The backing collision countermeasure system will consist of:
 - Rear park assist
 - Audio and visual warning inside the vehicle
 - Haptic signal include brake pulse
 - Automatic braking

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ACAT Team 3: GM-VTTI (con't)

- SIM tool for the GM-VTTI team
 - SIM will be based on the approach used to estimate safety impact of forward collision warning algorithms developed by VTTI
 - Plan to use data from 100-Car Naturalistic Driving Study and data from several past GM backing collision studies to develop the SIM
 - Objective tests will be conducted at VTTI's test facility

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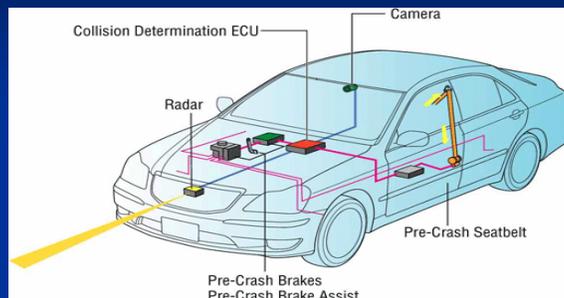
ACAT Team 4: Toyota



- Toyota Motor North America
- Total Cooperative Agreement Value is \$450,000
- Scheduled time to completion is 36 months
- Technology: Pre-Collision Safety System. The PCS system automatically predicts impending collisions, warns the driver, applies braking in order to reduce the effects of an impact, and tightens the seat belts to increase passenger restraint performance.

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ACAT Team 4: Toyota (con't)



- PCS consist of
 - Pre-Collision Brake Assist (PCBS)
 - Pre-Collision Brake (PCB)
 - Pre-Collision Seatbelt (PSB)

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ACAT Team 4: Toyota (con't)

- SIM tool for the Toyota team
 - SIM will be based on a previously developed version using Japan's vehicle crash data.
 - U.S. Crash data, e.g. FARS, CDS, etc., will be examined, analyzed and incorporated into the SIM development.
 - Objective tests will be conducted in a driving simulator and actual driving tests to provide inputs for the SIM.

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Updates on Activities

- Kickoff meetings of the ACAT teams were held in December 2006 and January 2007.
- ACAT teams have submitted their initial program management plans to NHTSA.
- ACAT teams gave their 1st quarterly briefings during April 2007.
- ACAT teams will participate in a program coordination workshop in June 2007 at Washington, D.C.

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Updates on Activities (con't)

- ACAT teams are actively working on the following technical tasks,
 - Examining available databases to develop descriptions of the crash sequence from non-conflict to crash and post-crash.
 - Defining components of individual SIM tools
 - Setting up the preliminary framework of the SIM tools
 - Developing objective tests for evaluation of the selected crash avoidance technologies.

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Q & A



Thank You

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