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IntelliDrive℠

Vehicle Safety Communications
Working Toward V2V Deployment

John Harding
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NHTSA
www.nhtsa.gov

U. S. Department of Transportation

Build V2V – Technology & Policy

- Engineering is not merely knowing and being knowledgeable, like a walking encyclopedia; engineering is not merely analysis; engineering is not merely the possession of the capacity to get elegant solutions to non-existent engineering problems; engineering is practicing the art of the organized forcing of technological change... Engineers operate at the interface between science and society...
  Dean Gordon Brown
- A policy is a temporary creed liable to be changed, but while it holds good it has got to be pursued with apostolic zeal.
  Mohandas Gandhi

Track 1 – Crash Scenario Framework

Objective – Create a crash scenario framework by which to identify safety applications needs.

Key Tasks

- Update of the pre-crash scenario statistics.
- Development of pre-crash scenario depictions and ranking by frequency and severity.
- Determination of requirements and specifications for priority scenario safety applications.
- Complete a Comparison of the priority safety applications to existing and emerging safety applications.
- Selection of priority safety applications for prototype development (Track 4).

Track 2 - Interoperability

Objective – To ensure safety applications work across all equipped vehicles.

Key Tasks

- Complete relevant communication standards and protocols (SAE J2735 message set, IEEE1609).
- Develop and Demonstrate security protocols that are practical, scalable, and deployable. This must include definition of a Certificate Authority (CA) implementation that is not reliant on the widespread deployment of public infrastructure.
- Develop procedures for ensuring message integrity and prevent misuse of communication capability. This will allow the host vehicle to determine the data received from another vehicle is valid and accurate.
- Establish data rights and other policies needed to define driver's privacy rights.

Track 3 – Benefits Assessment

Objective – Estimate the safety benefits of V2V safety applications.

Key Tasks

- Development of safety application measures of performance.
- Development of safety application objective test procedures
- Adaptation of ACAT Safety Impacting Methodology.
- The use of real-world exposure data to estimate benefits.
- The conduct of the safety application system prototype objective tests.
- The estimation of safety application benefits.
- The review and verification of estimated safety benefits.
- Produce information that supports Regulatory Decision

Track 4 – Application Development

Objective – Develop and prototype selected safety applications.

Key Tasks

- The transfer of safety application prototype development information.
- Design and development of safety application prototypes (includes positioning requirements).
- The transfer of prototype to task 3 for evaluation.

Track 5 – Driver Issues

Objective – Develop Framework that can assess the impact of driver issues on the effectiveness of V2V safety systems.

Key Tasks

- Development of a safety management concept to ensure proper integration of interfaces when several warning systems are installed.
- Development of test procedures to determine the effective of various DVIs to obtain the desired driver response.
- Determine if drivers accept the new systems.
- Determine if the lack of standardization of the DVI among different vehicle makes and models may increase the likelihood of driver confusion in responding to the warning information intended to assist the driver.

Track 6 – IntelliDrive℠ Policy Issues

Objective – Identification of policy issues that are critical but not always unique to V2V and coordinate how these issues are addressed

Key Issues

- Security & Privacy Policy
- 5.9 Enforcement
- Aftermarket
- Governance
- Business Models

V2V Traditional and Non-Traditional Aspects

- Current authorities provide a framework for the deployment of traditional aspects of V2V under existing USDOT authority
- Non-traditional aspects will be covered by augment authority or new authority as indicate by V2V research

Traditional Aspects

Requirements for FMVSS

- Must meet a safety need
- Be practicable (technologically and economically)
- Objectively measurable compliance
- Performance-oriented (not design restrictive)
- Appropriate for each vehicle type

- Track 1
  - Priority Crashes
- Track 2
  - Technology
- Track 3
  - Safety Benefits
- Track 4
  - Safety Apps
- Track 7 & 8
  - Vehicle types

Building V2V - Compliance

- Certification of Equipment
  - New vehicles & equipment
    - Ensure interoperability
    - DSRC safety performance
    - Self-Certification
- Enforcement (Traditional)
  - Compliance Checks
  - Performance Monitoring
  - Fraud
  - Procedure

- Track 2
  - Standards and protocols
- Track 3
  - Performance specification
- Track 5
  - DVI
- Human Factors
  - Distraction
- Device Certification

Non-Traditional Aspects

Building V2V - Operations

- Security
  - Certificate updates
    - No user Fees
    - Monitoring (ID bad players)
  - Privacy/Enforcement balance
- Maintenance/Enforcement (Non-traditional)
  - Equipment
    - Maintain/update
  - 5.9 GHz
    - Licensing
  - Malicious behavior

- Track 2
  - Security configurations
  - Equipment
- Track 3
  - System performance
- Track 4
  - Functional safety
- Safety Pilot
  - Security model
  - Equipment evaluations
- IntelliDrive Policy/Track 6
  - Authority/Jurisdiction
  - Legal
  - Governance

Build V2V – Aftermarket Devices

- Automotive equipment
  - DSRC for safety
  - Compliance
  - Basic Safety Message
  - Safety Applications
- Carry-in devices
  - Basic Safety Message
  - Compliance
  - Security
  - Driver Distraction

- Track 2
  - Basic Safety Message
  - Security configuration
- Safety Pilot
  - Aftermarket Devices
- Track 3
  - BSM Devices
- Human Factors
  - Guidelines
- IntelliDrive/Track 6
  - Authority

Build V2V – Business Models