



V2V

Vehicle-to-Vehicle Safety Application Research Plan

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SS32: IntelliDrive: The Next Generation Program



Potential for Cooperative Systems

- Vehicle Communications will enable advanced and effective safety applications
- Potential to save thousands of lives every year
- Enables the concept of *Vehicles that don't crash*
- Additionally, enables mobility, productivity, environment, and convenience functions

Involving Key Stakeholders

- **Cooperation & Collaboration**
 - International Vehicle Communications Workshop & World Congress Demonstration – November 2008
 - Facilitated global understanding about what needs to be done and how to move forward Cooperative Systems
 - Stakeholder Workshop – March 2009
 - Expedited Interoperability Efforts
 - Added Policy Track
 - Adding Commercial Vehicle Track

Prior Research

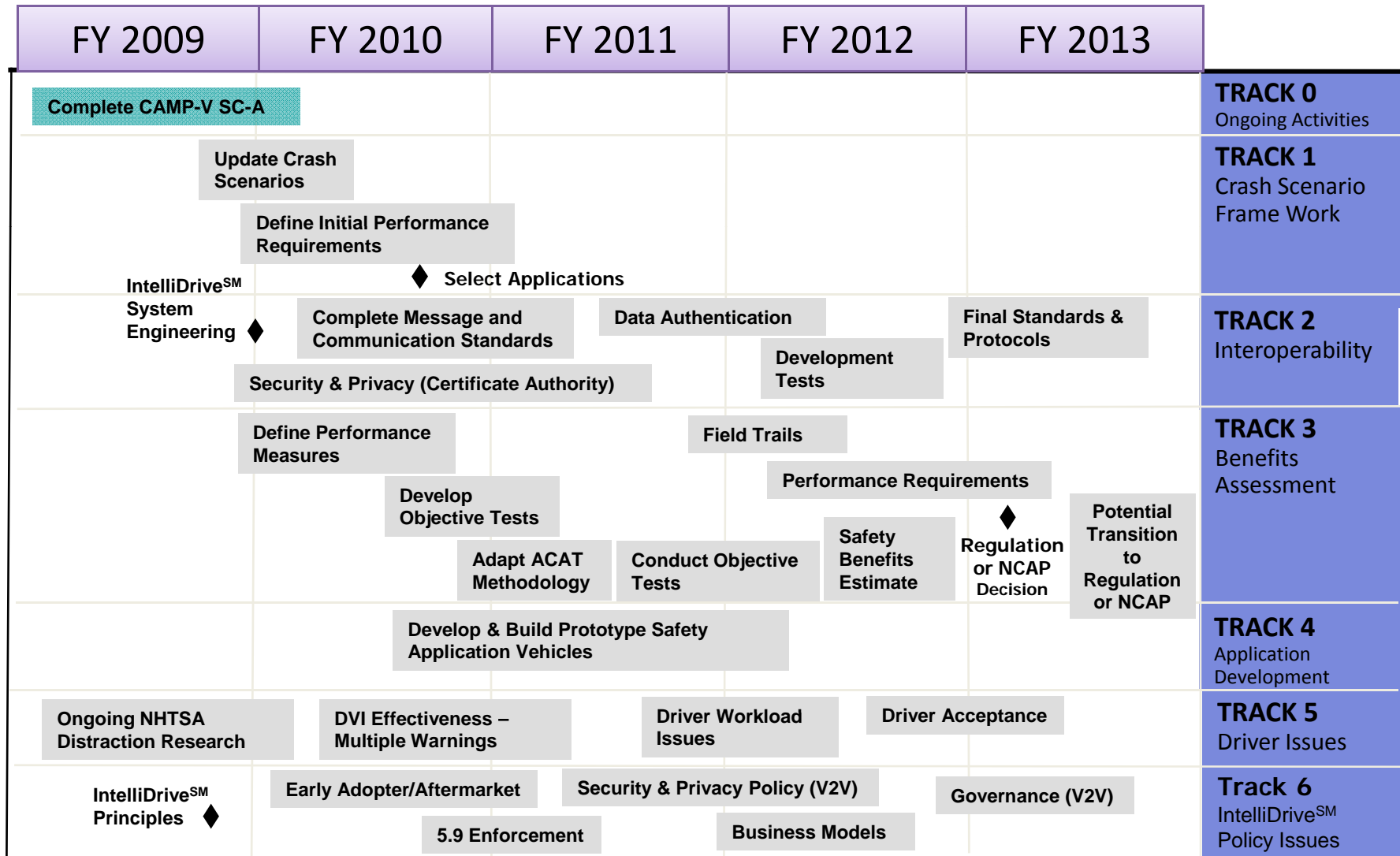
- VSC-A Project
 - Goal: Determine if DSRC @5.9 GHz & vehicle positioning can improve upon autonomous vehicle-based safety systems and/or enable new communication-based safety applications
- CICAS-V Project
 - Goal: To prototype a cooperative vehicle and infrastructure system that reduces the likelihood and severity of crashes at intersections controlled by a stop sign or traffic signal by warning the vehicle driver that an intersection violation is about to occur.

V2V Research Plan Assumptions

1. The first application of V2V is to enable safety applications.
2. The deployment of V2V need not and should not be slowed by roadway infrastructure.
3. The system architecture will be compatible with the evolution in infrastructure technology and deployment.
4. DSRC at 5.9 GHz is our chosen communication option.



V2V Safety Research Plan



Track 1 – Crash Scenarios

- Objective – Create a crash scenario framework by which to identify safety applications needs.
- Key Tasks
 - Development of pre-crash scenario depictions and ranking by frequency and severity.
 - Comparison of the priority safety applications to pre-crash scenarios.
 - Selection of priority safety applications for prototype development (Track 4).

Track 2 - Interoperability

- Objective – 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.
 - Develop procedures for ensuring message integrity and prevent misuse of communication capability.

Track 3 – Benefits Assessment

- Objective – Estimate the safety benefits of V2V safety applications.
- Key Tasks
 - Development of objective test procedures & performance measures
 - Evaluate prototypes
 - Estimation of safety benefits
 - Regulation or NCAP decision

Track 4 – Application Development

- Objective – Develop and prototype selected safety applications.
- Key Tasks
 - The transfer of safety application prototype development information.
 - Develop & build prototypes for safety applications
 - Transfer of prototype to task 3 for evaluation.

Track 5 – Driver Issues

- Objective – Identify and address key driver issues with safety applications
- Eliminate Crash Risk Due to Distraction
- Effectiveness of crash countermeasures should not be reduced by designs that are incompatible with driver capabilities and needs
- Information systems should not introduce additional risks

Track 6 – IntelliDriveSM 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
 - Early Adopter/Retrofit
 - Security & Privacy Policy
 - 5.9 Enforcement
 - Business Models
 - Governance

Conclusion

- Advanced technologies have enormous safety potential
- NHTSA is actively pursuing deployment of effective safety technologies
- Vehicle Communications will enable advanced and effective safety applications
- Challenges must be met for deployment
 - Collaboration is key
- Need to guard against unintended consequences, such as driver distraction