IVI Governance Structure

Enabling Research and Development

U.S. Department of Transportation

ITS Joint Program Office

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1. Enabling Research and Development

The Enabling R&D group will provide a forum for industry and government to work cooperatively together to establish and prioritize IVI research goals and conduct and evaluate supporting research. The focus of the research will be pre-competitive and is expected to be within 5-10 years of deployment. Membership in this group will be open to all vehicle OEMs with a World Manufacturer Identifier, as defined by SAE, and will require contribution of substantial financial resources.

The Light Vehicle Enabling Research activities will be carried out by the Crash Avoidance Metrics Partnership (CAMP). The CAMP Intelligent Vehicle Initiative (IVI) Enabling Research Program is work on a set of key pre-competitive projects designed to enable the successful deployment of emerging crash avoidance and driver information systems. Ford Motor Company and General Motors Corporation created CAMP in 1995 to conduct joint pre-competitive projects to accelerate the deployment of future crash avoidance measures. The program utilizes the flexibility of this existing mechanism to bring together various combinations of DaimlerChrysler Research and Technology, North America, Inc., Ford Motor Company, General Motors Corporation, Honda R&D Americas, Inc., Navigation Technologies Corporation, and Toyota Motor Corporation to conduct 3 specific IVI projects. Not all of the companies listed participate in each project.

In a letter dated August 13, 1999, an unsolicited technical proposal was submitted to U.S. DOT by the Crash Avoidance Metrics Partnership (CAMP) on behalf of DaimlerChrysler Research and Technology, North America, Inc., Ford Motor Company, General Motors Corporation, Honda R&D Americas, Inc., Navigation Technologies Corporation, and Toyota Motor Corporation. The proposal contains three separate projects involving different combinations of proposed participants. The three projects include: (1) Forward Collision Warning Requirements, (2) Driver Workload Metrics, and (3) Enhanced Digital Maps.

The three research projects identified in the proposal address the fundamental IVI issue of driver acceptance which will be a critical element of successful deployment. Common safety system functionality, intuitive function and interface design, and management of driver workload are prominent pre-competitive enabling elements of driver acceptance.

The first project, Forward Collision Warning Requirements (FCW) will examine driver performance and alert functions/ interface modality requirements associated with rear-end crash scenarios involving nighttime and wet road conditions, non-constant lead vehicle deceleration profiles and last second lane change (rather than braking) maneuvers will be examined. The results will support the validation of collision warning algorithms and interface design.

The second project, Driver Workload Metrics, will develop practical, repeatable driver workload metrics for both visual and cognitive demand that can realistically assess which types of driver interface tasks are appropriate to perform while a vehicle is in motion. It will then identify

interface design approaches which emerging collision avoidance and comfort and convenience oriented information systems might employ in order to provide acceptable workload performance ratings.

The third project, Enhanced Digital Maps (EDMap), will develop a range of digital map database enhancements that enable or improve the performance of various driver assistance systems presently under development or consideration. Digital map navigation may be able to act as an additional sensor for various driver assistance systems, providing information about the vehicle's relationship to the roadway infrastructure that is not feasible to obtain with other sensors such as radar or computer vision. It will not obviate the need for these other sensors, but may add a necessary component for successful implementation of future systems. The results of this effort will provide direction to map suppliers regarding enhancements needed to enable future driver assistance systems and establish the preliminary feasibility of generating and maintaining these enhancements.

2. Infrastructure Consortium

US DOT identified the need for an Infrastructure Consortium to support the IVI in sponsoring and directing research programs intended to address the IVI problem areas that may require vehicle-infrastructure cooperation. The Infrastructure Consortium will represent the government stakeholders who must ultimately plan, design, build, operate, and maintain the highway infrastructure needed to effectively support any vehicle-highway cooperation.

The organization will be a group of states and representative local government agencies who are willing to participate and support, through financial, technical, and deployment means, the objective of improving highway safety through the use of IVI systems. The activities of the Infrastructure Consortium reflect the participants' collective assessment of the most effective means of improving highway safety within the scope of the initiative. The US DOT will, through the IVI and other programs, continue to pursue a broader research agenda, and will coordinate our own research with that supported through the Infrastructure Consortium.

US DOT has identified intersection and roadway departure collisions as the most likely candidates for vehicle-infrastructure cooperation. US DOT is conducting a comprehensive systems assessment to guide the course of future research. The results of this study will be shared with the Infrastructure Consortium, and jointly define a research program.

The Infrastructure Consortium will be considered an FHWA Vehicle Regional Pooled Fund Study. This provides a mechanism for states (& others) to combine resources towards common research interests. It allows for contributions of State Planning & Research (SP&R) funds, state DOT funds, and other funds. This pooled fund was established in October 1998 to support specialty vehicle research. In July 1999, the participants agreed to refocus the activity on infrastructure related issues. California and Minnesota are currently members. Virginia, Iowa, Arizona and Michigan are considering membership.

3. Research and Operational Testing

This will be the mechanism by which US DOT conducts research and operational testing that is not carried out with the Enabling Research Group or Infrastructure Consortium. Activities may be carried out as individual cooperative agreements or as direct federal contracts. This mechanism gives US DOT the flexibility and independence to carry out research and operational testing that is in the public interest. The following list is a sample of activities carried out under this category:

- Rear-end Field Test (Cooperative agreement)
- Generation 0 Operational Tests (Cooperative agreement)
- IVI Benefits Assessment (Internal Government Study)
- Transit Rear-end Collision Performance Specification (Cooperative agreement)
- Multiple Systems Integration Study (Contract)

4. Federal Advisory Committee

ITS America will provide the forum for IVI discussion and recommendation by the stakeholders of the advanced transportation community as a federal advisory committee. Similar to the process used for industry review and feedback of the IVI Request for Information, ITS America will organize working groups to address specific issues identified by the stakeholders. These groups will report to an IVI Steering Group consisting of senior representatives from key stakeholder groups.

The IVI Steering Group and related platform activities will be contained within the ITS America Coordinating Council. The working groups will deliver advice to the IVI Steering Group on an annual basis for the formulation of a broad set of recommendations on the overall IVI program. The recommended advice generated by the IVI Steering Group will be forwarded to the Coordinating Council at which point it may be delivered to the U.S. DOT if the advice is of a technical nature. If the recommendation is of a nature concerning IVI policy, the advice will ultimately be passed onto the ITS America Board of Directors for approval and transmittal to the U.S. DOT. The timing of the process will be structured to coincide with the U.S. DOT budget cycle in order to achieve maximum impact for IVI recommendations.

IVI Governance Model