Integration of Electronic Systems into Vehicle Control

Issue:
While work still continues to improve the crashworthiness of vehicles, the key to greatly reduced injuries and deaths is to implement systems that will prevent crashes from occurring. Efforts in this area were really not feasible until the state of electronics was advanced to the degree which would permit reliable, affordable technology to be introduced. While there are critics of the increasing use and safety of electronics in vehicles, all parties must be permitted to develop reliable, safe systems that will enhance the safety of the public.

Background:
Implementation of crash-avoidance technologies is a key to reducing vehicle-traffic injuries and fatalities. Electronic systems enable the safe implementation of various technologies such as stability control, lane-departure warning, forward-crash warning, and adaptive cruise control, as well as the entire “Connected Vehicle” concept, which includes Vehicle to Vehicle (V2V) and Vehicle to Infrastructure (V2I) technologies. SAE’s wealth of knowledge with existing and developing standards in this area should be used by both industry and government agencies to assist in the adoption of these life-saving advances and the necessary regulations to ensure proper and cost-effective designs. However, care must be taken by all interested parties not to minimize that the ultimate responsibility for the safe operation of vehicles is that of the driver/operator and that any system used is to aid the driver in making smart, informed decisions.

SAE has worked with both industry and government to develop consensus-based standards related to those technologies listed in the above paragraph. Use of these standards as well as those developed by other standards development organizations would benefit all parties in the end. The industry would benefit by having a common set of guidelines that would be used to maximize both the safety and the cost savings, which result when the need for duplicate designs is eliminated. Government benefits in that the regulation development costs are reduced by the use of consensus standards. Finally, the consumer benefits when standards referenced in regulations eliminate the use of different protocols and procedures when using the technologies in vehicles.

While the automotive sector application will assist drivers in avoiding crashes, the technology can be used to its maximum when applied to military and off-road applications such as mining and farming equipment. Autonomous vehicle operation will enhance the safety of troops in combat situations as well as increasing productivity and safety in the mining and farming sectors. The work within each sector should be shared to maximize the benefits to all. Having experience in each sector makes SAE a valuable resource for industry and government.

Recommendations:
SAE International recommends that the use of electronic systems for crash avoidance in automobiles be increased to take full advantage of systems that could greatly reduce deaths and injuries related to vehicle incidents. However, in a time of financial constraint, the research associated with technologies that would permit fully autonomous vehicle operation should concentrate on applications to military and off-road work vehicles. These areas would benefit more quickly from fully autonomous technology than the automotive sector. SAE can be of benefit to the automotive community as well as the military and off-road sectors in pursuit of their respective goals.