

Enabling Aftermarket Devices with DSRC-Based Communications Capabilities: Summary of Input from Industry Stakeholders

I. Overview

In April 2009, the ITS JPO solicited input from a variety of private and non-governmental entities on how to accelerate the marketplace for aftermarket devices and products that might be enabled with dedicated short range communications (DSRC) capability—the capability to communicate vehicle-to-vehicle information and messaging and to provide the “Here I Am” message as a basis for IntelliDriveSM safety applications.

The ITS JPO sought to understand the major issues facing manufacturers, and the potential for the Federal government to play a role in addressing those issues or overcoming impediments to commercialization of DSRC-enabled aftermarket devices.

Input was gathered by a team of researchers through one-on-one telephone interviews and questions provided via email. The information gleaned from eighteen (18) telephone interviews and five (5) email responses is summarized below. To date, input has been received from a range of private and public sector representatives including: cell/smart phone manufacturers, PND manufacturers, wireless service providers, DSRC equipment manufacturers, network and system developers, public safety agencies, consultants, and academia. Although the interviews focused specifically on the issues with providing devices, some stakeholders provided input on the role of OEMs, government mandates, and the market turnaround time for new technologies.¹

This information is being used by the ITS JPO to frame discussion topics at a set of U.S. DOT workshops. These results of the interviews, workshops, and further discussion will help the U.S. DOT identify strategies for accelerating the marketplace and identify appropriate actions as a Federal government agency.

II. Interview Questions

In general, the interview questions were focused in three discussion areas:

Part I: Enabling a Device or Product

- Has your firm considered incorporating DSRC into your device/product? If not, why not? If so, what are some of the product development or market challenges that you face?

Part II: Issues, Obstacles, Impediments, Barriers

¹ Please note that this document is a summary of a set of interview responses and not do necessarily reflect the views of the U.S. Department of Transportation (USDOT). The USDOT provides this summary of stakeholder input as a means of promoting discussion.

- What are the other, non-technical challenges to creating DSRC-enabled devices and products? For instance, can you envision policy issues, consumer issues, market issues, global issues, etc? Setting of standards?
- Which of these issues are the most important to address in the near-term? Which are the most costly or expensive to overcome? Which are the most technologically challenging? Which would require the most consumer education or marketing?

Part III: Role of Federal government in overcoming issues and obstacles

- Are there opportunities or incentives that might motivate your company to more aggressively pursue commercial opportunities with respect to DSRC enabled devices?
- Is there a role for the federal government in addressing these issues? What is your perspective on how the DOT might assist?
- Do these areas involve funding technology innovation? Researching safety benefits? Testing and demonstrating product feasibility? Conducting market research? Creating rules or regulations that mandate DSRC-enabled devices? Others?

III. Issues and Challenges Identified

Stakeholders identified issues and challenges in two broad categories: **technology** and **business challenges**.

Technology Issues and Challenges

- **Existence of other communications technologies.** Some interviewees asked why the Federal government was pursuing investment in DSRC when other, proven communication technologies exist (4G, W-Max, Wi-Fi, etc)? Some of the interviewees requested that an analysis be done that compares the characteristics of the various technologies.
- **Frequency conflicts.** There are concerns that communicating over 5.9 GHz DSRC may not be effective in highly congested situations, as well as concerns that “desensitization with added transmitters” might occur. Further, there is some concern that the entire radio network could “jam” in large-scale deployments. This was problematic in at least one real-world test in India.
- **Latency.** The current latency for DSRC may not be acceptable for hard- and some soft-safety applications. For safety applications, the time needed to authenticate networks and share certificate authority must be shorter. There should be a common control channel to ensure low latency.

- **Security.** Because safety applications require a more “computationally-intensive” form of security than the 1609.11 standard this could create cost-prohibitive hurdles to developing an aftermarket device that runs safety apps.

Business Issues

- **There must be a compelling business case for DSRC-enabled aftermarket devices.** There has not yet been a compelling business case made for using DSRC in aftermarket devices. Furthermore, for handset makers there does not appear to be any compelling business advantage (other than for safety-critical apps) to use DSRC instead of other mobile communications technologies.
- **It would take time to enable existing devices.** It may take as long as 3-5 years to enable existing devices with DSRC chipsets. It may be more feasible to modify existing handset models (e.g. mobile phones) but it would be problematic for personal handsets to be used as part of a network of sensors delivering safety information. (example from Synthesis)
- **There is only one global DSRC chipset manufacturer. Could this one company provide enough of their product to supply a greatly enlarged market?** Some companies have “tweaked” existing chipsets for DSRC, but there is not a large pool of vendors currently mass-producing the DSRC chipsets that would be needed to make aftermarket devices.
- **The potential liability is significant. Who gets blamed when people in cars equipped with DSRC devices are in fatal accidents?** OEMs and other companies are wary of making themselves liable to lawsuits resulting from expectations created by this potential new market.

IV. Recommended Solutions

Stakeholders made some general recommendations.

- **Establish rigorous standards.** There is a continued need to establish rigorous standards and protocols for licensing any technology. Several stakeholders believed that the Federal government needs to establish these standards.
- **Commit to interoperability and an open platform.** These are crucial to private sector investment in devices or services.
- **Manage private sector liability:** Mandate vehicular “black boxes for cars.” Liability is an important issue with both hard and soft safety applications; the Federal government should mandate a “black box” in vehicles. By limiting the private sector’s liability, government removes another business obstacle companies currently face.

Encourage reforming Federal statutes regarding lawsuits to make it less likely a company providing DSRC devices or services will be sued due to accidents involving cars equipped with DSRC-enabled technology.

- **Combine 5.9 GHz DSRC with electronic tolling deployment.** Leverage existing electronic tolling capabilities by mandating, encouraging, or incentivizing state and local agencies to add DSRC-enabled equipment. This would be an easier way to begin to deploy DSRC than for hard safety functions.

Stakeholders made further specific recommendations in four categories: **technological issues and challenges, business challenges, broader cultural issues, and the role of the Federal government.**

Technology Issues

- **Improve a Standard Protocol:** Develop a more computationally intensive form of security than 1609.11. Encryption is processing-intensive and cost-prohibitive for an individual firm at current market levels.

Business Issues

- **Overcome the negative experience with VII.** The private sector invested corporate R&D funds (and in some cases, personal funds) to explore DSRC V2I communications. There was an expectation that the Federal government was going to invest in nationwide or large-scale test-bed infrastructure, and that the OEMs would be mandated to embed DSRC-enabled radios in vehicles. Since this did not happen firms never realized their investments. The shift from VII to SafeTrip to IntelliDriveSM was difficult to understand and follow.
- **Provide Public Sector Leadership** “It’s a chicken-and-egg situation.” The private sector is unwilling to build products for which there is no market or a compelling business case. Government is hesitant to mandate that OEMs embed devices, and is looking to the private sector to accelerate deployment. The public is likely unwilling to pay high premiums for brand new devices or applications, especially safety-based applications.
- **Increase the pace of deployment.** The pace of development has been far too slow for many private sector players. This creates an “unacceptable return on investment” for many companies. Until government funds the infrastructure deployment, it will be difficult to convince stakeholders to commit to an open-ended, long-term approach.

Cultural Issues

- **Address the serious cultural differences between entities involved.** The IT and telecom industries have corporate and organizational cultures that are completely different from those of the automakers and of government. While the public sector is seeking

“perfection,” the IT industry is accustomed to starting fast and releasing multiple iterations of a product or service to achieve end-state success. Additionally, while the IT and telecom industries engage in rapid development and deployment, the automakers need a longer term to design, develop, and deploy equipment. The three entities need to understand one another better and agree on both end-state goals and interim goals.

- **Open up the dialogue about the technology, business model, and standards.** By some accounts, the process of developing the VII model, brainstorming about standards, and discussing other aspects of the program was “closed and counterproductive.” There are companies that felt left out of the process, and thus their commitment to seeing the program fully deployed was compromised.

Role of the Federal Government

- **Show public sector commitment to and investment in DSRC.** It is still not clear what level of commitment DOT is going to make to deploying DSRC capabilities nationwide or in a large-scale test bed. Device manufacturers and OEMs may prioritize DSRC capabilities once it is clear that the government is behind the “business case” for DSRC-enabled devices. The Federal government needs to articulate its priorities in the near- and long-terms in order to have more credibility with the private sector.
- **Provide financial incentives. “The public won’t pay for safety.”** Financial incentives for consumers to purchase and install DSRC-enabled aftermarket or personal devices would offset their costs, providing the missing market incentive. Consider a tax credit, a rebate, or some other financial incentive to create a consumer market. Additionally, the private sector’s cost to develop equipment would be passed on to the consumer, so a rebate or tax credit could offset this cost.
- **Provide other incentives.** Disseminate research findings in plain language that the public understands to make the case for the safety benefits of DSRC V2V or V2I communication. Communicate the benefits of DSRC so that people want to buy product or service.
- **Force OEMs to use DSRC to delivery real-time safety messages.** This is the only way to achieve full deployment.
- **Facilitate an open and rigorous standards development process.** Government needs to facilitate rather than lead the process of developing standards. Effective standards could evolve over time and grow with the industry and the platform and can prevent competing platforms from emerging from different manufacturers.