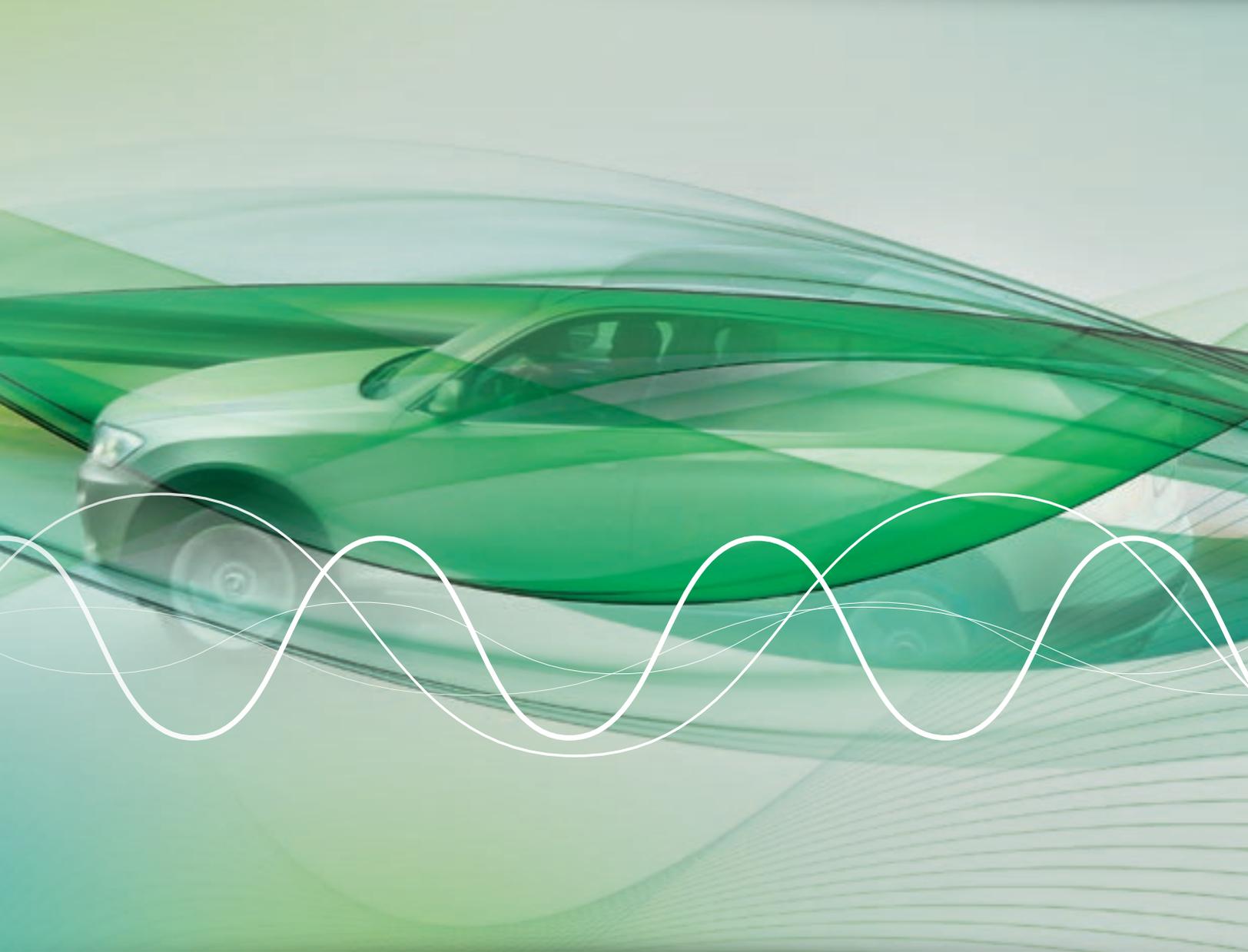


DSRC Myth Fact



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based on Dedicated Short Range Communications (DSRC) have the potential to provide multiple societal benefits, including saving lives, reducing crashes, increasing mobility, and moving toward a more sustainable transportation system. Following over a decade of research and nearly a billion dollars of public and private investment, the National Highway Traffic Safety Administration (NHTSA) will soon propose a new Federal Motor Vehicle Safety Standard to require DSRC in all new vehicles to support Vehicle-to-Vehicle (V2V) communication for safety applications. In addition, the U.S. Department of Transportation is leading the development of Vehicle-to-Infrastructure (V2I) communication technology using DSRC for safety, automation, mobility, and sustainability applications.

The 5.9 GHz spectrum band has been allocated by the Federal Communications Commission (FCC) for DSRC-based Intelligent Transportation Systems vehicle safety and mobility applications. DSRC is uniquely configured to enable continuous, low latency, and secure data exchanges among moving vehicles and between vehicles and roadway infrastructure or mobile devices (collectively referred to as V2X), to support safety-critical applications, as well as automation, mobility, and environmental applications. The FCC is also inquiring about the feasibility of sharing spectrum in the 5.9 GHz band with unlicensed users to ease Wi-Fi congestion. Automakers are open to sharing this spectrum as long as there is no harmful interference to V2X communication throughout the 5.9 GHz band.



This document seeks to clarify some of the confusion surrounding the DSRC issue by addressing common myths.



DSRC has taken too long to develop and will never be deployed.



DSRC is an obsolete technology. There are newer ways to support V2X communications, such as LTE or 5G.



Re-channelization in the 5.9 band is a reasonable approach to sharing.

FACT

DSRC is a proven technology that is already deployed on public roadways.

► The Department of Transportation, in collaboration with the Intelligent Transportation Society of America and the auto industry, successfully completed several pilot programs that have not only proven the technology's functionality but also the public's support. In a recently released report to Congress, the DOT states that, "DSRC has proven the ability to provide all of the critical attributes needed to support Connected Vehicle safety applications, which no other wireless technology has at this time. DSRC is important to the Nation as it can be configured to enable real-time crash-avoidance alerts and warnings...[and] also provides an important new capability for enhancing the performance and safety of automated vehicles—allowing automation to reach its full potential." (FHWA-JPO-15-218, July 2015). DSRC systems are already deployed in other regions of the world for traffic mitigation purposes, and General Motors will deploy this technology in the United States this year in its model year 2017 Cadillac CTS vehicles.

FACT

DSRC is the only currently available technology proven for supporting the low latency communications requirements of V2X safety applications.

► Today's LTE wireless communications cannot adequately support communications for crash-imminent vehicle safety applications. Today's LTE network has been designed for an entirely different purpose — broadband wireless access — which has very different technical requirements than crash imminent safety communications. Latency, interference and coverage are examples of the technical challenges LTE-supported V2X would face. Moreover, no competing standards-based technology to DSRC has yet been offered as suitable for crash imminent safety communications. Any claims regarding future 5G capabilities are premature, since the underlying standards are not yet completed. Even when the 5G standards are completed - now expected between 2018 and 2020 - it will be years before they are widely deployed, and even longer before testing could be completed in order for NHTSA to determine if this technology could adequately support the low latency communications requirements of V2X.

FACT

Re-channelization will result in DSRC interference and will certainly delay DSRC deployment.

► DSRC deployment has begun, based on a band plan and rules defined in FCC regulations, and following a successful sequence of research, analysis, design, standardization, and large scale testing activities at a significant cost to the industry and government. Since this rigor is necessary for automotive safety-of-life systems, the re-channelization concept supported by Qualcomm would require repeating many of the steps in that sequence and may very well result in a DSRC system that the industry and regulators no longer have confidence to deploy. There are many problems with the re-channelization proposal. Critical V2V safety messages would have to move to the upper band, disrupting the balance of the existing band plan. There they would be subjected to new sources of interference from high power public safety communication and immediately-adjacent unlicensed transmissions. With re-channelization, other critical safety communications in the lower band would be subject to in-band interference from unlicensed transmissions aggressively using the band at the same time and place as DSRC. Furthermore, the DSRC communication in the lower band would be forced to use degraded 20 MHz channels, contrary to exhaustive research demonstrating the superiority of 10 MHz channels for the high mobility, high multipath DSRC environment. The forced use of 20 MHz channels would also make it impossible to deploy the same safety systems in other regions of the world that use 10 MHz or to adopt the same spectrum sharing solution worldwide.



DSRC will take forever to penetrate the fleet, so the benefits will be limited.



DSRC isn't necessary for autonomous vehicles. Other technologies, such as sensors, have surpassed it.



Any NHTSA mandate should be technology neutral.

FACT

DSRC-enabled vehicles will produce benefits even with limited penetration.

▶ V2V crash-imminent safety applications do not require ubiquitous fleet penetration. It has been estimated that most of these applications can achieve safety benefits at 30-40% fleet penetration rates¹. Some of these applications, such as emergency electronic brake lights, are expected to achieve noticeable safety benefits at lower penetration rates of around 20%². Furthermore, aftermarket/retrofit devices will become available that can enable vehicles already on the road to be updated with DSRC units, allowing for higher penetration rates to be achieved more rapidly. The roll-out of crash imminent safety applications using DSRC, and the achievement of the related longer-term safety benefits, are similar to the roll-out of unleaded gas. Both have strong public-sector benefits and both require longer time frames to achieve the full benefits. But, both demonstrate measurable public benefits within several years.

FACT

DSRC is important to the advancement of autonomous vehicles.

▶ V2V communications transmit messages between vehicles about vehicle speed, direction, brake status, and other information with range and detection capabilities that exceed sensor/camera/radar-based systems — in some cases, nearly twice the distance. This longer detection distance and ability to “see” around corners or “through” other vehicles help V2V-equipped vehicles perceive some threats sooner than sensors, cameras, or radar can, and warn their drivers accordingly. DSRC will augment information from on-board sensors, cameras, and GPS to provide greater situational awareness and improve the decisions made by automated vehicles regarding safety-critical situations. In NHTSA's recently updated Preliminary Statement of Policy Regarding Automated Vehicles, the agency states that, “...the realization of the full potential benefits and broad-scale implementation of the highest level of automation may conceivably rely on V2V technology as an important input to ensure that the vehicle has full awareness of its surroundings.”

FACT

Utilizing the same DSRC technology and basic safety message is essential to achieving V2V benefits.

▶ To maximize the benefits of V2V communications, there must be a common infrastructure in place. In order to meet the peer-to-peer low-latency communication requirements for crash-imminent safety applications, vehicles need to be ‘talking’ to each other using the same technology. This means exchanging the same basic information, on the same frequency to be assured that the information exchanged is accurate, reliable and can be trusted. Extensive work has been done to develop standards that establish protocols for information exchange and define message content for communicating specific information using DSRC. Moreover, the same radios that will be mandated as part of the future NHTSA action also support vehicle to infrastructure communications that today are part of the Federal Highway Act funding program. This allows vehicles to interact with roadside infrastructure to support safety, automation, mobility, and sustainability applications.



DSRC safety-critical communications could be consolidated into fewer channels.



DSRC will never be used for V2I.



The auto industry does not want to share the 5.9 GHz spectrum band.

FACT

All 75 megahertz of spectrum is needed to improve safety, mobility and sustainability.

► The FCC has allocated 75 megahertz of spectrum at 5.850-5.925 GHz to the mobile service for use by DSRC systems operating in the Intelligent Transportation System (“ITS”) radio service. In making this allocation for DSRC, the FCC noted that DSRC applications are a key element in meeting the nation’s transportation needs and in improving the safety of our nation’s roadways. Sufficient spectrum is necessary to facilitate the development and growth of DSRC applications that are anticipated in the future. V2V crash imminent safety applications, enabled by the planned NHTSA rulemaking, are only the first of the many DSRC applications expected to be widely deployed. Examples of expected future DSRC applications include additional low-latency V2V applications to support automated vehicles, public safety applications for ambulances and other emergency responders, vehicle to infrastructure applications to decrease traffic congestion and vehicle to pedestrian applications to improve urban movement and safety. Without all 75 megahertz of spectrum, these applications will not likely emerge.

FACT

DSRC-enabled V2I applications are already deployed in Japan as well as in pilot programs around the United States.

► Road operators are interested in using DSRC to enhance road safety, limit congestion, and to minimize the environmental impact of road use. Pilot deployments of V2I are currently underway at three sites and include at least 35 public sector applications that are related to public safety³. Most of these applications are place-limited and leverage the characteristics of short-range communications provided by 5.9 GHz DSRC. The larger list of applications planned for deployment by road operators includes provisions to use appropriate communications technologies, such as cellular, for applications that do not require lower latencies or short range communications. However, there are a significant number of the planned V2I applications that are identified as most appropriate for DSRC deployment, and these are primarily applications that enhance road safety.

FACT

Automakers support sharing the 5.9 GHz band as long as sharing is done without harmful interference. Automakers and other stakeholders are currently testing a sharing proposal.

► NHTSA and the automobile industry are open to sharing the DSRC spectrum, but only if that sharing does not cause harmful interference to DSRC transmissions. In fact, automakers have been working in close coordination with Cisco and Denso in support of a detect and vacate approach that will enable Wi-Fi devices to operate in the 5.9 GHz band without causing interference to DSRC units operating in the same area. Likewise, FCC Chairman Wheeler has stated his commitment to ensuring that band sharing can only be accomplished if DSRC safety applications do not suffer harmful interference⁴. DSRC is a public good, not an auto industry product. It is not just the automobile industry that is concerned about preventing potential harmful interference to DSRC communications; most of the DSRC spectrum is planned to be used by road operators, such as State DOTs, regional, county and local road authorities, for applications that leverage the short-range characteristics of DSRC to provide public benefits. Their broader definition of benefits for the public includes reducing road congestion and reducing the environmental impact of road operations.



AUTO ALLIANCE
DRIVING INNOVATION®

Richard Lopez

Senior Director, Federal Government Affairs
Alliance of Automobile Manufacturers
rlopez@autoalliance.org

GlobalAutomakers

Hannah Izon

Manager, Federal Government Affairs
Association of Global Automakers
hizon@globalautomakers.org

ITS **AMERICA**

Steve Bayless

Vice President, Technology and Markets
Intelligent Transportation Society of America
sbayless@itsa.org

SOURCES

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