Journal of Law and Mobility

Volume 2019

2019

The Airwaves Meet the Highways

David Redl
U.S. Department of Commerce

THE AIRWAVES MEET THE HIGHWAYS

DAVID REDL†

Cite as: David Redl, *The Airwaves Meet the Highways*,
2019 J. L. & MOB. 32.
This manuscript may be accessed online at https://futurist.law.umich.edu
and at https://repository.law.umich.edu/jlm/.

I applaud and congratulate the University of Michigan for launching the Journal of Law and Mobility. The timing is perfect. The information superhighway is no longer just a clever metaphor. We are living in an era where internet connectivity is a critical part of making transportation safer and more convenient.

Internet connectivity has powered the U.S. and global economies for years now. In the early stages, dial-up connections enabled users to access a vast store of digital information. As the internet and its usage grew, so did the demand for faster broadband speeds. Finally, wireless networks untethered the power of broadband Internet so consumers could have fast access when and where they want it.

We are now seeing technology advances in the automotive sector begin to better align with what has occurred in the communications space. The possibilities for what this means for human mobility are truly exciting. Challenges abound, however, with questions around the security and safety of self-driving vehicles and how to create the infrastructure and policies needed for vehicle connectivity. While many of these will be sorted out by the market, policy levers will also play a role.

In the late 1990s, the Federal Communications Commission (FCC) agreed to set aside radio frequencies for intelligent transportation systems (ITS), persuaded that emerging advances in communications technologies could be deployed in vehicles to increase safety and help save lives.[1] Specifically, the

---

† David Redl is the Assistant Secretary for Communications and Information at the U.S. Department of Commerce, and Administrator of the National Telecommunications and Information Administration.

1. Amendment of Parts 2 and 90 of the Commission's Rules to Allocate the 5.850-5.925 GHz Band to the Mobile Service for Dedicated Short Range Communications of

FCC allocated the 75 megahertz of spectrum between 5850-5925 MHz (5.9 GHz band) for ITS..[2] The automobile industry's technological solution was to rely primarily on a reconfiguration of IEEE Wi-Fi standards[3] suitable for ITS (802.11p) so vehicles could "talk" to one another and to roadside infrastructure..[4] The FCC in turn incorporated the Dedicated Short Range Communications (DSRC) standards into its service rules for the 5.9 GHz band..[5]

The National Telecommunications and Information Administration (NTIA), by statute, is the principal advisor to the President of the United States on information and communications policies, including for the use of radiofrequency spectrum. NTIA also is responsible for managing spectrum use by federal government entities. As such, NTIA seeks to ensure that our national use of spectrum is efficient and effective. Over the past two decades, innovations in wireless technologies and bandwidth capacity have completely changed what is possible in connected vehicle technology. 2G wireless evolved to 3G, and then 4G LTE changed the game for mobile broadband. 5G is in the early stages of deployment. Meanwhile, Wi-Fi not only exploded in usage but in its capability and performance. Many vehicles in the market today are equipped with wireless connectivity for diagnostic, navigation and entertainment purposes. Yet DSRC as a technology remains largely unchanged, notwithstanding recent pledges from proponents to update the standard..[6] This stasis persists despite the technological leaps of advanced driver assistance systems, enhanced by innovations in vehicular radars, sensors and cameras.

This situation is not new or novel as traditional industries continue to grapple with the pace of technological change in the wireless sector. In fact, the automotive sector has faced the challenge of wireless technological change before, struggling to adapt to the sunset of the first generation of analog wireless networks. This leads to the question of whether, as some promise, DSRC effectively broadens a vehicle's situational awareness to

---

Intelligent Transportation Services*, Report and Order*, 14 FCC Rcd. 18221 (Oct. 22, 1999).

2. *Id.*

3. *The Working Group for WLAN Standards*, IEEE 802.11 WIRELESS LOCAL AREA NETWORKS, http://www.ieee802.org/11/ (last visited Oct. 31, 2018).

4. Accepted nomenclature for these communications include vehicle-to-vehicle (V2V), vehicle-to-infrastructure (V2I), or more generally vehicle-to-x (V2X). Other applications include vehicle-to-pedestrian.

5. Amendment of the Commission's Rules Regarding Dedicated Short-Range Communication Services in the 5.850-5.925 GHz Band (5.9 GHz Band)*,* 19 FCC Rcd. 2458 (Feb. 10, 2004).

6. *See IEEE Announces Formation of Two New IEEE 802.11 Study Groups*, IEEE STANDARDS ASSOCIATION (June 5, 2018), https://standards.ieee.org/news/2018/ieee_802-11_study_groups.html.

beyond line-of-site as the industry creeps toward autonomous driving – or has innovation simply left DSRC behind? The answer is important to the question of whether it makes sense to continue with DSRC for V2X communications. Regardless of *how* the question is answered, we must address *who* should answer it.

One distinction between V2X communications for safety applications and most other communications standards choices is that a fragmented market could have drastic consequences for its effectiveness, given that vehicles must be able to talk to each other in real time for the entire system to work. This is why the National Highway Transportation Safety Administration (NHTSA) initially proposed a phased-in mandate of DSRC beginning with cars and light trucks.[7]

This question of whether to mandate DSRC has also been complicated by inclusion in 3GPP standards of a cellular solution (C-V2X), first in Release 14 for 4G/LTE,[8] and continuing with Release 15 and especially Release 16 for 5G, targeted for completion in December 2019.[9] It raises the legitimate question of whether leveraging the rapid innovation and evolution in wireless communication technology is the right way to ensure automotive safety technology benefits from the rapid pace of technological change, and what role the federal government should play in answering these questions.

Despite the federal government's legitimate interest in vehicle safety, as is true in most cases I question whether the federal government should substitute its judgement for that of the market. A possible solution that strikes a balance between legitimate safety needs and technological flexibility are federal performance requirements that maintain technological neutrality.

Moreover, because the spectrum environment has changed drastically since the 1990s many are questioning whether protecting this 75 megahertz of mid-band spectrum for ITS use is prudent. The 5.9 GHz band is adjacent to spectrum used for Wi-Fi,[10], which makes it unsurprising that some are calling for access to 5.9 GHz spectrum as a Wi-Fi expansion band.[11] Other

7. *See* Federal Motor Vehicle Safety Standards; V2V Communications, 82 Fed. Reg. 3854 (Jan. 12, 2017).

8. Dino Flore, *Initial Cellular V2X Standard Complete*, 3GPP A GLOBAL INITIATIVE (Sept. 26, 2016), http://www.3gpp.org/news-events/3gpp-news/1798-v2x_r14. The updates to the existing cellular standard are to a device-to-device communications interface known as the PC5, the sidelink at the physical layer, for vehicular use cases addressing high speed and high density scenarios. A dedicated band is used only for V2V communications.

9. *Release 16, 3GPP: A GLOBAL INITIATIVE (July 16, 2018),* https://www.3gpp.org/release-16.

10. Table of Frequency Allocations, 47 C.F.R. § 2.106 (2018).

11. Sean Kinney, *Is DSRC Dead? Cable cos want FCC action on 5.9 GHz*, RCR WIRELESS NEWS, (Oct. 17, 2018), https://www.rcrwireless.com/20181017/policy/dsrc-fcc-cable-companies.

still question whether V2V safety communications require protected access to all 75 megahertz. NTIA, the FCC, and the Department of Transportation continue to study the feasibility of whether and how this band might be shared between V2V and Wi-Fi or other unlicensed uses and remain committed to both the goal of increased vehicle safety and the goal of maximum spectrum efficiency..[12]

While I am optimistic that wireless technologies will bring a new level of safety to America's roadways, a number of other policy and legal issues, including user privacy and cybersecurity, will persist as challenges despite being addressed in current solutions. If we are to see the kind of adoption and reliance on V2X safety applications and realize the systemic improvements in safety they portend, Americans must have trust in the security and reliability of these technologies.

The marriage of communications technology with transportation will help define the 21st century, and potentially produce enormous benefits for consumers. A lot of work remains, however, to ensure we have the right laws, regulations and policy frameworks in place to allow private sector innovation to flourish. This forum can play an important role in moving the dialogue forward.

12. *See DSRC and U-NII-4 Prototype Device Testing*, FEDERAL COMMUNICATIONS COMMISSION, https://www.fcc.gov/oet/unii-4banddevice (last visited Nov. 1, 2018).