

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of

Use of the 5.850-5.925 GHz Band

)
)
)

ET Docket No. 19-138

**COMMENTS OF
THE FREE STATE FOUNDATION***

I. Introduction and Summary

These comments are submitted in response to the *Notice of Proposed Rulemaking* adopted by the Commission on December 12, 2019 regarding the use of the 5.850-5.925 GHz ("5.9 GHz") band.¹ The demand for additional spectrum, in particular mid-band spectrum, increasingly exceeds supply. We therefore welcome the FCC's decision to take a "fresh look" at this grievously underutilized resource and to repurpose spectrum in the 5.9 GHz band for unlicensed use.

Advances in communications capabilities hold the potential to reduce vehicle-related injuries and deaths. Dedicated Short-Range Communications (DSRC) technology once showed promise as a means to transmit accident-preventing messages from vehicle to vehicle and between vehicles and roadside infrastructure. That is why the FCC in 1999 dedicated 75 MHz of high-value spectrum in the 5.9 GHz band to this proprietary and unproven protocol. However, twenty years have passed, and it is now apparent that

* These comments express the views of Randolph J. May, President of the Free State Foundation, and Andrew Long, Senior Fellow. They do not necessarily represent the views of others associated with the Free State Foundation. The Free State Foundation is an independent, nonpartisan free market-oriented think tank.

¹ See generally *Use of the 5.850-5.925 GHz Band*, ET Docket No. 19-138, Notice of Proposed Rulemaking, FCC 19-129 (released December 17, 2019) (*NPRM*).

DSRC will never achieve its intended goals and that the spectrum dedicated to that technology should be repurposed for unlicensed use.

The success of a network-oriented safety application like DSRC hinges upon the ubiquitous integration of that technology into all vehicles on the road. That requires automobile manufacturers to build the standard into every new car – and even then, years must pass before incompatible models exit the roadways. In the case of DSRC, unfortunately, that simply is not what we have witnessed. To the contrary, only a subset of automobile manufacturers ever declared intentions to deploy DSRC, in just a few models, and on open-ended timelines. To our knowledge, however, only one such model has reached the market, and at least one company recently backed away from its previously announced plans. As a result, a timely route to the critical mass of DSRC-equipped vehicles necessary for meaningful safety improvements simply does not exist. Indeed, even the National Traffic Safety Board has concluded that, thirty years down the road from today, a simple majority of vehicles still might not be equipped with DSRC.

Fortunately, automotive manufacturers are deploying innovative safety solutions that address the goals of the Intelligent Transportation System (ITS) via other technical means. These include on-board cameras, sonar, light detection and ranging (LiDAR), and sensors that utilize different frequency bands as well as unlicensed spectrum. In addition, a new standard has emerged, Cellular Vehicle to Everything (C-V2X), that is supported by a number of manufacturers and incorporates common cellular protocols such as LTE and, potentially in the future, 5G.

Meanwhile, Wi-Fi networks operating in unlicensed spectrum, including frequencies directly below the 5.9 GHz band, have established themselves as an integral

component of the broadband ecosystem. The use of Wi-Fi continues to grow rapidly, and existing spectrum allocations struggle to keep up with demand. The increasing number of connected devices, driven in large part by the Internet of Things, exacerbates this trend.

In addition, the full benefits of the next generation of Wi-Fi technology, Wi-Fi 6, cannot be realized without access to wider (specifically, 160 MHz) channels – and existing unlicensed allocations cannot support such channels on their own. However, should the Commission adopt its proposal to reallocate the lower 45 MHz of the 5.9 GHz band for unlicensed use, that spectrum could be combined with existing Wi-Fi spectrum in the adjacent 5 GHz band to create the first contiguous 160 MHz channel unburdened by interference-avoiding (and performance-degrading) measures.

The FCC faces relentless pressure to make additional wireless capacity available for both licensed and unlicensed use. We emphasize that licensed spectrum remains very important, of course, and has an important role to play in furthering 5G deployment. But, here, the 5.9 GHz band presents a prime opportunity to reallocate what essentially is greenfield spectrum, quickly and with relative ease, to what is its best and highest use: unlicensed operations, in particular Wi-Fi. We therefore support the Commission's proposal to repurpose 45 MHz of DSRC spectrum in the 5.9 GHz band for unlicensed use.

II. The FCC Must Ensure that Spectrum Is Put to its Best and Highest Use

Spectrum is a finite and invaluable resource. Perhaps the FCC's most important responsibility is to manage its efficient use. One way that the agency can address the steadily worsening "spectrum crunch" is to revisit prior allocation decisions that have not lived up to *ex ante* expectations. Its decision twenty years ago to dedicate 75 MHz of "Goldilocks" spectrum in the 5.9 GHz band to a proprietary ITS technology – DSRC –

cries out for such a reassessment. As Commissioner Rosenworcel has acknowledged, "[t]here is no shame in correcting course.... [I]t's time to be ambitious and find a way forward that puts the 5.9 GHz band to fuller use."² We commend the Commission for taking this "fresh look" at the 5.9 GHz band and encourage it to continue to seek out opportunities to reallocate spectrum, whether on a licensed or unlicensed basis, to achieve its best and highest use.

III. After Twenty Years, Dedicated Short-Range Communications Technology Still Has Not Delivered on its Promise

The effectiveness of a network-oriented technology like DSRC depends upon its widespread adoption. Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) communications have the potential to eliminate accidents and injury, but only if all cars on the road are able to transmit and receive safety messages.³ Unfortunately, and despite two decades of opportunity, DSRC has failed to realize the network effects necessary for success.⁴ Just a few automobile manufacturers ever announced plans to incorporate DSRC into some – not all – of their vehicle models, and to do so over indeterminate

² Remarks of Commissioner Jessica Rosenworcel, Silicon Flatirons Conference (September 6, 2018), available at <https://docs.fcc.gov/public/attachments/DOC-353982A1.pdf>, at 4.

³ See WifiForward, "5.9 GHz: Best Opportunity for Better Wi-Fi Fast," available at http://wififorward.org/wp-content/uploads/2019/06/WFF_5dot9_Ghz_Primer_Final.pdf (pointing out that "V2V safety systems are not effective or reliable unless universally deployed in all U.S. cars and trucks"); Ferry Grijpink, *et al.*, "Connected world: An evolution in connectivity beyond the 5G revolution," McKinsey Global Institute (February 2020), available at https://www.mckinsey.com/~media/McKinsey/Industries/Technology%20Media%20and%20Telecommunications/Telecommunications/Our%20Insights/Connected%20world%20An%20evolution%20in%20connectivity%20beyond%20the%205G%20revolution/MGI_Connected-World_Discussion-paper_February-2020.ashx, at 40 ("[W]hile V2X pilots are underway, meaningful adoption of these use cases would need broad adoption across the entire car parc (all cars on the road), not just new sales. Even if all new cars are fully connected, it will take years for the entire car parc to turn over.").

⁴ See NCTA – The Internet & Television Association, "A Fresh Look at the 5.9 GHz Band" (October 16, 2018), available at <https://www.ncta.com/whats-new/a-fresh-look-at-the-59-ghz-band> ("After two decades and millions of dollars in wasted government subsidies, the Dedicated Short Range Communications (DSRC) experiment in the 5.9 GHz band has clearly failed.").

timeframes.⁵ And even those companies are reconsidering their commitments.⁶ Other manufacturers, meanwhile, now support a new, rival specification, C-V2X.⁷ As a consequence, the National Traffic Safety Board concluded that an additional three decades could pass before DSRC is deployed in a simple majority of cars.⁸ There simply is no clear path forward – on any realistic time horizon – to the widespread implementation of DSRC required to produce meaningful results. We therefore welcome the Commission's decision to revisit the 1999 allocation of 75 MHz of mid-band spectrum to this proprietary technology.

IV. Automobile Manufacturers Are Enhancing Vehicle Safety via Other Technological Means

Fortunately, the failure of DSRC to gain the necessary foothold has not stopped innovation and progress in vehicle safety. Automotive manufacturers increasingly are equipping cars with technology – cameras, sonar, LiDAR, and sensors – and leveraging

⁵ See, e.g., General Motors Press Release, "Cadillac to Expand Super Cruise Across Entire Lineup" (June 6, 2018), available at <https://media.cadillac.com/media/us/en/gm/news.detail.html/content/Pages/news/us/en/2018/jun/0606-its-cadillac.html> (announcing that Cadillac "plans to offer V2X communications in a high-volume crossover by 2023 and *eventually* expand the technology across Cadillac's portfolio" and noting that it "introduced vehicle-to-vehicle (V2V) communications on the CTS sedan in 2017") (emphasis added). It is noteworthy that Super Cruise™, the focus of this press release, "is made possible by precision LiDAR map data, high precision GPS, a state-of-the-art driver attention system and a network of camera and radar sensors" – not DSRC. *Id.*

⁶ See, e.g., Toyota Press Release, "2018 Camry and Sienna Get Spring Makeover Thanks to CarPlay and Amazon Alexa Retrofit" (April 26, 2019), available at <https://pressroom.toyota.com/2018-camry-and-sienna-get-spring-makeover-thanks-to-carplay-and-amazon-alexa-retrofit/> (announcing that "although Toyota has previously announced plans to install Dedicated Short-Range Communications (DSRC) technology for V2X on vehicles in the U.S starting in 2021, we have decided to pause our deployment at this time").

⁷ See Tim Stevens, "Ford's cars will start talking to each other in 2022," CNET (January 7, 2019), available at <https://www.cnet.com/roadshow/news/ces-2019-ford-c-v2x/> (noting that both Ford and Audi plan to support C-V2X, the former in all models beginning in 2022). According to Chairman Pai's Separate Statement on the *NPRM*, BMW, Daimler, and Tesla also back C-V2X.

⁸ See Lawrence J. Spiwak, "INSIGHT: Elaine Chao Needs to Better Prioritize DOT's Spectrum Fights," *Bloomberg Law* (September 25, 2019), available at <https://news.bloomberglaw.com/tech-and-telecom-law/insight-elaine-chao-needs-to-better-prioritize-dots-spectrum-fights>.

spectrum outside the 5.9 GHz band, including unlicensed spectrum, to deliver safety features that policymakers previously expected DSRC to provide.⁹ Moreover, the more recent C-V2X technology utilizes standard cellular protocols to provide not just V2V and V2I communications, but also connectivity to the Internet.¹⁰ It appears, then, that the well-functioning marketplace is filling in the gaps, as WifiForward explains:

[S]afety technology has moved on. Fully automated or self-driving vehicles provide the safety benefits of ITS while also operating without direct driver action to control steering, acceleration and braking. These systems rely on safety technologies like lidar, radar, cameras, and sensors that use other spectrum – or no exclusive spectrum at all.¹¹

Thus, while DSRC itself has not lived up to expectations, vehicle safety-related objectives nevertheless are being addressed.

V. Wi-Fi Would Benefit from Additional Spectrum

In 1999, the same year that the FCC dedicated spectrum to DSRC, the Institute of Electrical and Electronics Engineers (IEEE) issued the first Wi-Fi specification to realize

⁹ See, e.g., Honda, "What is Honda Sensing®?" available at <https://automobiles.honda.com/sensing> ("Honda Sensing® is our exclusive intelligent suite of safety and driver-assistive technologies designed to alert you to things you might miss while driving."); Volvo, "IntelliSafe Standard," available at <https://www.volvocars.com/intl/why-volvo/human-innovation/future-of-driving/safety/intellisafe-standard> ("City Safety uses radar and camera technology to identify other vehicles, cyclists, pedestrians and large animals, such a moose, elk or horses, day or night. It warns you if it detects an imminent collision and, if you don't react in time, it can automatically apply the brakes to help avoid or mitigate a collision."). See also NCTA – The Internet & Television Association, "A Fresh Look at the 5.9 GHz Band" (October 16, 2018), available at <https://www.ncta.com/whats-new/a-fresh-look-at-the-59-ghz-band> (arguing that "the free market for vehicle technologies has flourished . . . , using non-5.9 GHz spectrum and existing cellular technologies").

¹⁰ See generally 5G Automotive Association (5GAA), "Explore the Technology," available at <https://5gaa.org/5g-technology/c-v2x/>. According to the 5GAA, C-V2X "provides one solution for integrated V2V, V2I and V2P operation with V2N by leveraging existing cellular network infrastructure." *Id.* See also NPRM at ¶ 38 ("C-V2X is a standards-based communications system based on the 4G LTE-Pro system in 3GPP Release 14, with additional standard work currently underway to develop 5G C-V2X peer-to-peer mode.") (citations omitted).

¹¹ WifiForward, "5.9 GHz: Best Opportunity for Better Wi-Fi Fast," available at http://wififorward.org/wp-content/uploads/2019/06/WFF_5dot9_Ghz_Primer_Final.pdf.

significant commercial success, 802.11(b).¹² During the intervening two decades, DSRC has been incorporated into at most a few thousand vehicles in the United States, primarily a single Cadillac model.¹³ By contrast, there were 13 billion Wi-Fi-capable devices as of June 2019.¹⁴ Ericsson predicts that that number will increase to over 30 billion by 2030,¹⁵ and Cisco expects the total to reach 500 billion by 2050.¹⁶ Financial results tell a similar story: Wi-Fi's global economic value was nearly \$2 trillion in 2018 – with the U.S. representing twenty-five percent of that amount – and is predicted to approach \$3.5 trillion by 2023.¹⁷ In other words, while DSRC has failed to gain the traction necessary to advance automobile safety in a meaningful way, Wi-Fi has achieved widescale and well-documented success.

It is a victim of that success, as well. Wi-Fi currently utilizes unlicensed spectrum in the 2.4 GHz and 5 GHz bands allocated by the FCC beginning in 1985. That spectrum soon could be rendered unusable by increasing demand; already the 2.4 GHz band reportedly is too crowded to support enterprise applications effectively.¹⁸ Indeed,

¹² See Keith Shaw, "802.11: Wi-Fi standards and speeds explained," Network World (October 9, 2018), available at <https://www.networkworld.com/article/3238664/80211-wi-fi-standards-and-speeds-explained.html>.

¹³ See Comments of General Motors Corporation, *Office of Engineering and Technology Requests Comments on Phase I Testing of Prototype U-NII-4 Devices*, ET Docket No. 13-49, Public Notice, DA 18-1111 (released October 29, 2018), at 2 ("GM was first to market, deploying DSRC-based V2V on its Cadillac CTS in 2017.").

¹⁴ See Wi-Fi Alliance, "Wi-Fi Alliance® celebrates 20 years of Wi-Fi®" (June 4, 2019), available at <https://www.wi-fi.org/news-events/newsroom/wi-fi-alliance-celebrates-20-years-of-wi-fi>.

¹⁵ "Ericsson Mobility Report" (June 2018), available at <https://www.ericsson.com/assets/local/mobility-report/documents/2018/ericsson-mobility-report-june-2018.pdf>, at 16.

¹⁶ See "Cisco Edge-to-Enterprise IoT Analytics for Electric Utilities Solution Overview" (February 1, 2018), available at <https://www.cisco.com/c/en/us/solutions/collateral/data-center-virtualization/big-data/solution-overview-c22-740248.html>.

¹⁷ See Wi-Fi Alliance, "Global economic value of Wi-Fi® nears \$2 trillion in 2018," available at https://www.wi-fi.org/download.php?file=/sites/default/files/private/Value_of_Wi-Fi_Highlights.pdf.

¹⁸ See NCTA – The Internet & Television Association, "The Path to Gigabit Wi-Fi Starts with the 5.9 GHz Band" (November 20, 2019), available at <https://www.ncta.com/whats-new/the-path-gigabit-wi-fi-starts-with-the-59-ghz-band> ("The nation's first Wi-Fi band, 2.4 GHz, is so overburdened that experts say it is no

according to WifiForward, "[a]t least two recent studies have indicated we are headed for a Wi-Fi spectrum crisis – by one estimate we're going to need to find 1600 MHz of additional unlicensed spectrum to meet busy-hour demand by 2025."¹⁹ In addition, Cisco predicts that Wi-Fi will carry 51 percent of all IP traffic by 2022.²⁰ Additional unlicensed wireless capacity therefore is needed.

VI. Next-Generation Wi-Fi and the 5.9 GHz Band Are a Good Fit

Wi-Fi 6, also known as IEEE 802.11ax, is the latest version of the wireless networking technical standard. Wi-Fi 6 is able to support consumer demands both today and in the future through higher speeds, lower latency, and support for a greater number of devices.²¹ These capabilities also position Wi-Fi 6 well to serve as a robust complement to 5G.²² But Wi-Fi 6 cannot succeed on either front without access to

longer suitable for enterprise applications. And even unlicensed spectrum available at 5 GHz won't be enough to meet forecasted demand, much less support new technologies.").

¹⁹ WifiForward, "5.9 GHz: Best Opportunity for Better Wi-Fi Fast," available at http://wififorward.org/wp-content/uploads/2019/06/WFF_5dot9_Ghz_Primer_Final.pdf.

²⁰ See Michael Cooney, "Wi-Fi 6, 5G play big in Cisco's mobile forecast," *Network World* (February 19, 2019), available at <https://www.networkworld.com/article/3341099/wi-fi-6-5g-play-big-in-ciscos-mobile-forecast.html>.

²¹ See generally Wi-Fi Alliance, "Wi-Fi 6: Advanced uses for a new era of connectivity" (October 2019), available at https://www.wi-fi.org/download.php?file=/sites/default/files/private/Wi-Fi_6_Use_Case_white_paper_20191011.pdf.

²² According to Cisco, in just two years 71 percent of 5G traffic will be offloaded to Wi-Fi networks. See NCTA – The Internet & Television Association, "The Path to Gigabit Wi-Fi Starts with the 5.9 GHz Band" (November 20, 2019), available at <https://www.ncta.com/whats-new/the-path-gigabit-wi-fi-starts-with-the-59-ghz-band>. See also WifiForward, "5.9 GHz: Best Opportunity for Better Wi-Fi Fast," available at http://wififorward.org/wp-content/uploads/2019/06/WFF_5dot9_Ghz_Primer_Final.pdf (noting that "if this band opens for unlicensed use, commercial devices could be made available quickly and affordably. It also means that the United States will be able to deploy next-generation, 160-megahertz-wide gigabit Wi-Fi technologies, greatly increasing throughput and performance. The latest standard of Wi-Fi, 802.11ax, depends on these wide channels to bring consumers (including carriers that offload traffic to Wi-Fi) better outdoor coverage, gigabit speeds, better battery life, and more efficient Wi-Fi operations").

additional spectrum. Specifically, contiguous spectrum that supports the 160 MHz channels necessary to unlock all of its potential capabilities.²³

To its credit, the instant proceeding is not the FCC's only effort to identify and make available additional spectrum for unlicensed use. It also has proposed to allow unlicensed devices to share 1200 MHz between 5.925 and 7.125 GHz (the "6 GHz band"),²⁴ spectrum that abuts the upper portion of the 5.9 GHz band. Nevertheless, reallocating the lower portion of the 5.9 GHz band for unlicensed use appears to be the most expedient route to additional capacity for Wi-Fi.²⁵ That is because this 45 MHz of spectrum (5.850-5.895 GHz) is directly adjacent to the U-NII-3 band (5.725-5.850 GHz). The U-NII-3 band already is used for Wi-Fi, and, as a result, the two easily could be combined to create the first contiguous 160 MHz channel for Wi-Fi 6 not burdened by the required use of Dynamic Frequency Selection (DFS).²⁶

Significantly, the relative absence of incumbent users in the 5.9 GHz band means that the lower 45 MHz of spectrum could be put to use not just easily, but also quickly.²⁷

²³ Vijay Nagarajan, "160 MHz Channels: The Wi-Fi 6 Superhighway," *Broadcom* (August 23, 2019), available at <https://www.broadcom.com/blog/160-mhz-channels-wi-fi-6-superhighway> (explaining how the "benefits of Wi-Fi 6 will be fully unleashed with wider bandwidth from contiguous 160 MHz channels").

²⁴ See generally *Unlicensed Use of the 6 GHz Band*, ET Docket No. 18-295; *Expanding Flexible Use in Mid-Band Spectrum between 3.7 and 24 GHz*, GN Docket No. 17-183, Notice of Proposed Rulemaking, FCC 18-147 (adopted October 23, 2018).

²⁵ See, e.g., WifiForward, "5.9 GHz: Best Opportunity for Better Wi-Fi Fast," available at http://wififorward.org/wp-content/uploads/2019/06/WFF_5dot9_Ghz_Primer_Final.pdf ("The 5.9 GHz band is the best near-term opportunity for better, faster, higher-capacity Wi-Fi.").

²⁶ See 47 CFR § 15.407(h)(2) ("U-NII devices operating with any part of its 26 dB emission bandwidth in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems."). As the *NPRM* acknowledges, "[d]eveloping a dynamic frequency selection requirement can be a time-consuming endeavor that delays the introduction of equipment that could use the band, results in more complex and costly equipment, and could cause network-acquisition delays and service interruptions that could reduce the utility of the band for broadband access". *NPRM* at ¶ 17 n.38 (citation omitted).

²⁷ As the *NPRM* acknowledges, the 5.9 GHz band is "especially well positioned to deliver *immediate* and potentially significant benefits when used by unlicensed devices." *NPRM* at ¶ 16 (emphasis added).

According to the *NPRM*, there are only "approximately 100 current active licenses for DSRC roadside unit deployments throughout the country."²⁸ On-board units do not require individual licenses, therefore the precise number of DSRC-equipped vehicles presently on the roads is unknown.²⁹ However, there appears to be widespread agreement that that number also is relatively small.³⁰ Given that "after 20 years there has still been no significant ITS usage of the band,"³¹ incumbent licensees here should not impede the Commission's efforts. Reallocating to unlicensed use the lower 45 MHz of the 5.9 GHz band thus offers immediate benefits and no practical downside.³²

VII. The Commission Can Take Steps to Avoid Repeating Past Mistakes with Respect to the Upper 30 MHz of the 5.9 GHz Band

The *NPRM* proposes a "balanced approach" to reallocation of the 5.9 GHz band that would free the lower 45 MHz for innovative unlicensed use (*e.g.*, Wi-Fi 6) but retain the upper 30 MHz for specific vehicle safety technologies (*i.e.*, C-V2X or both C-V2X

²⁸ *NPRM* at ¶ 32 (citation omitted).

²⁹ *Id.* (noting that "[t]he Commission does not track the deployment of on-board units that are licensed-by-rule under Part 95").

³⁰ *See, e.g.*, Statement of Commissioner Michael O'Rielly ("[T]his spectrum still remains – at least by any rational person's estimation – highly underutilized. For 20 years, the Commission has awaited the great promise of vehicular safety DSRC apps to materialize, but what we have actually received are a few localized systems and limited equipment in a discontinued car line."); WifiForward, "5.9 GHz: Best Opportunity for Better Wi-Fi Fast," available at http://wififorward.org/wp-content/uploads/2019/06/WFF_5dot9_Ghz_Primer_Final.pdf ("[T]he band is essentially empty in the vast majority of the country. There is simply no other band with as few existing operations."); NCTA – The Internet & Television Association, "A Fresh Look at the 5.9 GHz Band" (October 16, 2018), available at <https://www.ncta.com/whats-new/a-fresh-look-at-the-59-ghz-band> (stating that "no other mid-band spectrum is so underutilized or has fewer incumbent operations").

³¹ Coleman Bazelon, *et al.*, "Spectrum in a Shared Economy: The 5.9 GHz Band," *The Brattle Group* (December 2019), available at https://brattlefiles.blob.core.windows.net/files/17871_spectrum_in_a_shared_economy_-_the_5_9_ghz_band.pdf, at 1. *Cf. Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, Report and Order and Order of Proposed Modification, GN Docket No. 18-122, FCC 20-22 (released February 28, 2020), available at <https://docs.fcc.gov/public/attachments/FCC-20-22A1.pdf>.

³² *See id.* at 4 ("Given that the vehicle safety benefits will be preserved in the dedicated 30 megahertz ITS portion, the opportunity cost of splitting the band with WiFi is very low.").

and DSRC). In order to avoid the risk of stranding even a portion of this spectrum for another twenty years, we offer the following suggestions.

First, the Commission may want to consider the impact that dual allocations – 10 MHz for DSRC and 20 MHz for C-V2X – might have on the ability of either technology to realize the network effects essential to success. As we describe above, accident-preventing messaging can take place only between vehicles and roadside devices that are able to communicate with each other. As a result, every vehicle on the road must support common standard(s) in order to achieve meaningful safety-related improvements in automotive safety. The *NPRM* makes clear, however, that DSRC and C-V2X are "mutually incompatible."³³

Would dedicating spectrum to both technologies make it less likely that either will achieve the critical mass necessary to be effective? Are automobile manufacturers unlikely to support more than one vehicle safety application? To the extent that the record suggests the answer to these questions is "yes," the Commission may conclude that making spectrum available for only one vehicle safety technology is the preferred approach. Because C-V2X is the newer application, appears to have broader support from manufacturers, incorporates standard cellular protocols (*i.e.*, LTE and potentially 5G in the future), and is not tied to a specific frequency band,³⁴ we suggest that it would be the better option.

³³ See *NPRM* at ¶ 31.

³⁴ See WifiForward, "5.9 GHz: Best Opportunity for Better Wi-Fi Fast," available at http://wififorward.org/wp-content/uploads/2019/06/WFF_5dot9_Ghz_Primer_Final.pdf ("Qualcomm and other C-V2X proponents have acknowledged that the C-V2X standard, at least, is not band specific and that in future releases, the standard could operate in any band ranging from below 1 GHz to much higher bands.").

Second, the Commission might want to consider adopting deployment milestones or similar implementation requirements for spectrum allocated to a specific vehicle safety application. The American public will not reap the full benefits of V2V and V2I communications until and unless a critical mass of vehicles and roadside devices are capable of sending and receiving safety messages. And even when all new vehicles do support vehicle safety technology – whether C-V2X, DSRC, or both – many more years will pass before older models exit the roadways. In order to protect this valuable mid-band spectrum from another two decades of underutilization, the Commission could take steps such as (1) defining clear implementation deadlines, and (2) putting parties on notice that further reallocation will occur should those deadlines not be met.

VIII. Conclusion

The objective that policymakers hoped to achieve twenty years ago in dedicating this spectrum to DSRC – preventing vehicle-related injuries and deaths – without question is of the utmost importance. Thankfully, and despite the failure of DSRC specifically to attain the level of deployment necessary to produce meaningful results, that goal is being realized via other, largely marketplace-driven, means.

Accordingly, and for the reasons set forth above, we agree that "[d]esignating the 5.850-5.895 GHz band for unlicensed operations is likely to generate quantifiable benefits for consumers, stakeholders, and the American economy"³⁵ – and to do so without undermining safety-related objectives. We therefore urge the Commission to take prompt action to conclude this proceeding and unleash the full potential of next-generation Wi-Fi.

³⁵ *NPRM* at ¶ 63.

The upper 30 MHz of the 5.9 GHz band may yet serve a role in advancing vehicle safety, perhaps in situations where there is no line of sight, as Commissioner O'Rielly has suggested.³⁶ However, given the high value of this spectrum, the general trend in automotive safety to rely upon other technologies (cameras, sonar, LiDAR, sensors) and frequency bands, the experience to date with DSRC, and the broad advantages that flexible use offers over specific, command-and-control technologies,³⁷ we ask that the FCC consider safeguards to avoid repeating the lost opportunity of the past twenty years. Mid-band spectrum is far too valuable to lay fallow.

Respectfully submitted,

Randolph J. May
President

Andrew Long
Senior Fellow

Free State Foundation
P.O. Box 60680
Potomac, MD 20859
301-984-8253

March 6, 2020

³⁶ See Separate Statement of Commissioner Michael O'Rielly (acknowledging that "newer 5.9 GHz systems may be able to address one glaring need: helping to alert drivers and thus prevent accidents when there is no line of sight").

³⁷ See WifiForward, "5.9 GHz: Best Opportunity for Better Wi-Fi Fast," available at http://wififorward.org/wp-content/uploads/2019/06/WFF_5dot9_Ghz_Primer_Final.pdf ("The U.S. abandoned a government-knows-best 'beauty contest' model for allocating spectrum long ago because it led to failures just like the 5.9 GHz band. The fact is that the government is terrible at guessing the future of technology. Subsidizing one set of companies by granting free and exclusive access to spectrum kills investment and innovation and leads to under-utilized spectrum.").