

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
MVDDS 5G Coalition)	File No. RM-11768
)	
Petition for Rulemaking to Permit MVDDS Use)	
of the 12.2-12.7 GHz Band for Two-Way)	
Mobile Broadband Service)	

COMMENTS OF COMPETITIVE CARRIERS ASSOCIATION

Steven K. Berry
President & CEO

Rebecca Murphy Thompson
EVP & General Counsel

Elizabeth Barket
Law & Regulatory Counsel

COMPETITIVE CARRIERS ASSOCIATION
805 15th Street NW, Suite 401
Washington, DC 20005
www.ccamobile.org

June 8, 2016

TABLE OF CONTENTS

I. INTRODUCTION AND SUMMARY	1
II. DISCUSSION	2
<i>A. 5G Networks Promise to Revolutionize Mobile Technology and Spur Innovation in Numerous Industries for the Benefit of American Consumers.</i>	<i>2</i>
1. Enhanced mobile broadband.	5
2. Ultra-reliable and low latency communications.....	5
3. Massive machine-type communications.	7
<i>B. The Commission Should Make More Spectrum Available for 5G.....</i>	<i>8</i>
1. The 12.2-12.7 GHz Band is Well-Situated for Deployment for 5G Technology.	9
2. Current Restrictions Make Use of the 12.2-12.7 GHz Band Prohibitive For Mobile Broadband.	10
3. Allowing Use of the 12.2-12.7 GHz Band for Mobile Services Would Support Commission Policies.....	10
II. CONCLUSION.	11

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
MVDDS 5G Coalition)	File No. RM-11768
)	
Petition for Rulemaking to Permit MVDDS Use)	
of the 12.2-12.7 GHz Band for Two-Way)	
Mobile Broadband Service)	

COMMENTS OF COMPETITIVE CARRIERS ASSOCIATION

Competitive Carriers Association (“CCA”) hereby submits the following comments on the MVDDS 5G Coalition’s (“MVDDS Coalition’s”) Petition for Rulemaking (“Petition”) in the above-captioned proceeding.¹ The Petition requests that the Federal Communications Commission (“FCC” or the “Commission”) permit use of the 12.2-12.7 GHz band for two-way mobile broadband service. Considering the current spectrum crunch, the Commission should make the 12.2-12.7 GHz band available for the deployment of Fifth Generation (“5G”) networks.

I. INTRODUCTION AND SUMMARY

CCA is the nation’s leading association for competitive wireless providers and stakeholders across the United States. CCA’s membership includes nearly 100 competitive wireless providers ranging from small, rural carriers serving fewer than 5,000 customers to regional and national providers serving millions of customers. CCA also represents approximately 200 associate members including vendors and suppliers that provide products and services throughout the mobile communications supply chain.

¹ MVDDS 5G Coalition Petition for Rulemaking to Permit MVDDS Use of the 12.2-12.7 GHz Band for Two-Way Mobile Broadband Service, RM No. 11768 (filed Apr. 26, 2016) (“Petition”); *see also Consumer & Governmental Affairs Bureau Reference Information Center Petition for Rulemaking Filed*, Public Notice, Report No. 3042 (rel. May 9, 2016) (seeking comment on Petition).

Advanced technologies like enhanced mobile broadband and machine-to-machine communications technologies are either in use or on the cusp of real-world application, but competitive carriers need access to 5G-compatible spectrum like the 12.2-12.7 GHz band before these ultra-reliable and low latency communications can become offered services. Indeed, the 12.2-12.7 GHz band meets the Commission's criteria for spectrum suitable for 5G technology, and the targeted rule changes discussed in the Petition will help to achieve the true potential of this band. Considering the current need for more spectrum and the Commission's history of encouraging productive use of scarce spectrum resources, unleashing 12.2-12.7 spectrum for mobile broadband use would be appropriate and in line with Commission precedent. Further, such an action could relieve, to some degree, spectrum consolidation under the two largest carriers. In the interest of competition among wireless carriers and driving innovation in the 12.2-12.7 GHz band, CCA urges the Commission to allow this spectrum to be used for mobile broadband services.

II. DISCUSSION

A. 5G Networks Promise to Revolutionize Mobile Technology and Spur Innovation in Numerous Industries for the Benefit of American Consumers.

Although we are just at the beginning of the 5G technological paradigm, competitive mobile carriers need more spectrum resources now to fulfil demand for higher network performance. The 12.2-12.7 GHz band may be used, under the right circumstances, for mobile broadband use supporting 5G applications, and the Commission would be remiss in denying competitive carriers a chance to repurpose this spectrum to alleviate the well-documented spectrum crunch. Demand for mobile data services has exploded in recent years and this trend will undoubtedly continue. Indeed, global mobile data traffic is estimated to increase eightfold

between 2015 and 2020.² This growth will be fueled by several factors, including continued increases in network connection speeds, a competitive BDS market, the number of mobile devices and connections, the amount of mobile video traffic, and finally competitive spectrum policies. For example, average mobile network connection speeds will more than triple by 2020.³ Mobile-connected devices will grow to 11.6 billion by 2020, exceeding the world's population (7.8 billion) at that time.⁴ Mobile video traffic will increase eleven-fold between 2015 and 2020, accounting for three-fourths of the world's mobile data traffic by 2020.⁵

To meet this enormous demand, the industry has begun developing 5G mobile broadband networks and technologies.⁶ 5G is not merely another standard that will provide faster broadband.⁷ Rather, 5G will be a whole new generation of technology that enables carriers to

² *Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2015-2020*, CISCO, at 5 (Feb. 3, 2016), <http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.pdf> (“Cisco Visual Networking Index”).

³ *Id.* at 3.

⁴ *Id.*

⁵ *Id.*

⁶ See, e.g., Rishi Tejpal & Toni Nygren, *Market Trends: 5G – A New Generation of User Experience and Opportunities*, GARTNER, at 2 (Aug. 7, 2015), <https://www.gartner.com/doc/reprints?id=1-31ERYE6&ct=160317&st=sb> (“Gartner Market Trends”) (“With 5G, the telecom industry anticipates solutions to the expected pain points generated by exponential demand growth for data services.”); *5G Use Cases and Requirements*, NOKIA, at 1 (2014), http://www.networks.nokia.com/sites/default/files/document/5g_requirements_white_paper.pdf. (“Nokia Use Cases”) (“The continuing growth in demand from subscribers for better mobile broadband experiences is encouraging the industry to look ahead at how networks can be readied to meet future extreme capacity and performance demands.”); *5G Vision White Paper*, SAMSUNG, at 5 (Feb. 2015), <http://www.samsung.com/global/business-images/insights/2015/Samsung-5G-Vision-0.pdf> (“Samsung White Paper”).

⁷ See, e.g., Ian King & Scott Moritz, *5G Networks Will do Much More Than Stream Better Cat Videos*, BLOOMBERG (May 2, 2016), <http://www.bloomberg.com/news/articles/2016-05-02/5g-networks-will-do-much-more-than-stream-better-cat-videos> (“Bloomberg News”) (“5G is not about another G with super-fast Internet,’ says Ericsson Chief Executive Officer Hans Vestberg. ‘5G is about beyond smartphones and tablets. We think 5G could provide an excellent opportunity to transform our world’”).

satisfy explosive consumer demand for data-intensive applications and richer, more consistent mobile broadband experiences.⁸ 5G will also provide the backbone for the “Internet of Things” (“IoT”),⁹ which promises to realize a host of mobile broadband use cases previously thought unachievable.

To support these innovative use cases, 5G networks are expected to deliver greater throughput, lower latency and higher connection density than existing networks.¹⁰ 5G networks are expected to provide data rates of more than 1 Gbps¹¹ and peak data rates of greater than 10 Gbps.¹² These networks will also deliver latency of less than the one millisecond,¹³ which is as much as one-tenth of the latency of today’s 4G networks.¹⁴ Further, 5G networks are expected to support up to one million devices per square kilometer for use in a variety of IoT applications.¹⁵ As competitive carriers have noted in other 5G-related proceedings, mobile broadband networks

⁸ See, e.g., *Gartner Market Trends* at 8; *The Road to 5G: Drivers, Applications, Requirements and Technical Development*, GSA – GLOBAL MOBILE SUPPLIERS ASSOCIATION, at 15 (2015), http://www.huawei.com/minisite/5g/img/GSA_the_Road_to_5G.pdf (“*GSA Executive Report*”).

⁹ See, e.g., *5G Spectrum Recommendations*, 4G Americas (Aug. 2015), http://www.4gamericas.org/files/6514/3930/9262/4G_Americas_5G_Spectrum_Recommendations_White_Paper.pdf (“*4G Americas Recommendations*”) (“[T]he future also will be much more than just enhancements to the ‘conventional’ mobile broadband use cases. . . . Thus, in the future, wireless access will go beyond humans and expand to serve any entity that may benefit from being connected. This vision is often referred to as ‘the Internet of Things (IoT),’ ‘the Networked Society,’ ‘Machine-to-Machine communications (M2M)’ or ‘machine-centric communications.’”); *GSA Executive Report* at 5.

¹⁰ See, e.g., *5G Vision: 100 Billion connections, 1 ms Latency, and 10 Gbps Throughput*, HUAWEI, <http://www.huawei.com/minisite/5g/en/defining-5g.html> (last visited May 24, 2016) (“*Huawei 5G Vision*”); *Gartner Market Trends* at 2, 5-6.

¹¹ See, e.g., Samsung White Paper at 4-5 (“As a baseline, 5G systems will provide gigabit-rate data services regardless of a user’s location.”); *Gartner Market Trends* at 2.

¹² See, e.g., *4G Americas Recommendations* at 1; *Huawei 5G Vision*.

¹³ See, e.g., *Gartner Market Trends* at 4; *Samsung White Paper* at 5.

¹⁴ *Samsung White Paper* at 5.

¹⁵ See, e.g., *id.* at 2; *Leading the World to 5G*, QUALCOMM TECHNOLOGIES, INC., at 3 (Feb. 2016), <https://www.qualcomm.com/media/documents/files/qualcomm-5g-vision-presentation.pdf> (“*Qualcomm Presentation*”).

of the future will require tens of thousands of new cell sites to address exploding consumer demand for wireless data services each of which will require backhaul resources.¹⁶

The many use cases for 5G can generally be divided into three categories: enhanced mobile broadband, ultra-reliable and low latency communications, and massive machine-type communications.¹⁷

1. Enhanced mobile broadband.

Enhanced mobile broadband applications require both very high data rates and low latency to allow users to have intensive, multimedia experiences.¹⁸ These applications will be supported both in very high density areas (such as stadiums) and with ubiquitous coverage.¹⁹ Enhanced mobile broadband applications include ultra high-definition (“UDH”) video,²⁰ virtual reality²¹ and augmented reality.²²

2. Ultra-reliable and low latency communications.

¹⁶ Letter from Paul Margie, Walter Anderson, and V. Shiva Goel, Counsel to Sprint Corporation, to Marlene H. Dortch, Secretary, FCC, at 1, WC Docket No. 05-25 (filed Sept. 23, 2015) (“Sprint Letter”); *see* Letter from Rebecca Murphy Thompson, EVP & General Counsel, CCA, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177, *et al.* (filed June 7, 2016); *see also* Comments of Competitive Carriers Association, Docket No. 160331306-6306-01 (filed June 2, 2016) (Comments in NTIA’s Notice and Request for Public Comment titled “The Benefits, Challenges, and Potential Roles For the Government in Fostering the Advancement of the Internet of Things”).

¹⁷ *See, e.g., 4G Americas Recommendations* at 2; Salah Eddine El Ayoubi *et al.*, *Preliminary Views and Initial Consideration on 5G RAN Architecture and Functional Design*, METIS-II, at 5 (Mar. 8, 2016), <https://metis-ii.5g-ppp.eu/wp-content/uploads/5G-PPP-METIS-II-5G-RAN-Architecture-White-Paper.pdf> (“METIS-II White Paper”).

¹⁸ *See, e.g., Samsung White Paper* at 3; *METIS-II White Paper* at 5.

¹⁹ *See, e.g., 4G Americas Recommendations* at 1; *5G Use Cases*, ERICSSON, at 4 (2015), <https://www.ericsson.com/res/docs/2015/5g-use-cases.pdf> (“Ericsson Use Cases”).

²⁰ *See, e.g., Samsung White Paper* at 3; *Ericsson Use Cases* at 10; *4G Americas Recommendations* at 23.

²¹ *Samsung White Paper* at 4 (These applications provide “a world where physical presence is simulated by computer graphics, and the user can actively interact with the simulated elements”).

²² *Id.* (Augmented reality applications graphically add real-time information based on user context to a display, thereby adding value for the user).

As the name suggests, these applications (many of which are machine-to-machine) require high reliability and low latency, often for safety or other operational reasons.²³ They have the potential to deliver extraordinary benefits to consumers across a variety of industries, including the healthcare and automotive industries. Examples of applications in the ultra-reliable and low latency communications category include the following:

Remote surgery: The less-than-1 millisecond latency and high reliability, among other characteristics, of 5G networks will allow doctors to perform surgery remotely using robots.²⁴ Patients in remote areas will be able to undergo procedures to which they may not otherwise have had access,²⁵ improving health outcomes and reducing medical costs.

Self-driving cars: Driverless cars are considered a “perfect use-case for 5G.”²⁶ They will utilize the ultra-high reliability and ultra-low latency of 5G technologies to exchange data with nearby vehicles to avoid collisions and increase traffic safety.²⁷

Industrial automation: 5G technologies will enable real-time remote control of heavy machinery. As a result, employers will be able to reduce safety risks to employees working in hazardous environments (such as construction sites, power plants, mines, and oil platforms) and

²³ See, e.g., *GSA Executive Report* at 6; *Ericsson Use Cases* at 2-3, 6.

²⁴ See, e.g., Gartner Market Trends at 6; Jamie Carter, *How 5G Will Radically Change the Internet of Things*, TECHRADAR (Mar. 28, 2016), <http://www.techradar.com/us/news/internet/how-5g-will-radically-change-the-internet-of-things-1317758> (“TechRadar News”); see also *Bloomberg News* (“To ensure a robot reacts instantly to a surgeon operating remotely, 5G networks will have built-in processing, store data closer to where it’s needed and use multiple forms of radio waves to send and receive traffic.”).

²⁵ See *TechRadar News* (“Think of a patient in a far-flung rural village without permanent medical personnel having a life-saving procedure performed by a surgeon in a remote city.”).

²⁶ *Id.* (internal quotation omitted).

²⁷ See, e.g., *Nokia Use Cases* at 9.

allow employees with unique or specialized skills to remotely manage multiple projects from a single location, thereby increasing efficiency and reducing costs.²⁸

3. Massive machine-type communications.

Massive machine-type applications enable huge volumes of devices and sensors to communicate with each other.²⁹ They have the potential to transform everyday tasks by connecting machines.³⁰ While some of these applications could be supported on a reasonable scale using 4G networks, 5G networks could potentially allow them to handle substantially larger numbers (*i.e.*, up to tens of billions) of connections efficiently.³¹ Examples of massive machine-type communications applications include the below examples.

Smart transportation: 5G will facilitate real-time collection of vast quantities of data from cars, drivers, pedestrians, road sensors, and traffic cameras to reduce traffic congestion.³² For instance, 5G technologies could “help optimize traffic lights and road usage, direct public transportation to where it is needed most, navigate vehicles to avoid congestion, raise tolls to limit traffic entering a congestion zone, etc.”³³ As a result, commuters may see productivity gains, decreases in pollution, and improvements in quality of life.

²⁸ See, e.g., ERICSSON, *Real Time Remote Control of Heavy Machinery with 5G*, FCC Spectrum Frontiers Workshop (Mar. 10, 2016), <https://transition.fcc.gov/bureaus/oet/5G/Workshop/Ericsson.pdf>; see also Johan Torsner *et al.*, *Industrial Remote Operation: 5G Rises to the Challenge*, ERICSSON TECHNOLOGY REVIEW, at 2-3 (Nov. 4, 2015), http://www.ericsson.com/res/thecompany/docs/publications/ericsson_review/2015/etr-5g-remote-control.pdf.

²⁹ See, e.g., *GSA Executive Report* at 6; *METIS-II White Paper* at 5.

³⁰ See, e.g., *Samsung White Paper* at 2; *4G Americas Recommendations* at 2.

³¹ *GSA Executive Report* at 6.

³² *4G Americas Recommendations* at 20.

³³ *Id.*; see also *TechRadar News*.

Wearables: For both health and fitness, 5G will support the adoption of wearable computing devices and sensors. For example, wearable sensors will be able to provide remote monitoring of a patient’s blood pressure and heart rate³⁴ to prevent medical emergencies before they occur.³⁵ 5G networks will “enable these and other future medical applications through significant improvements to wireless data throughput and network capacity.”³⁶

Widespread use of these technologies, it is worth noting, will not be possible without equitably-priced business data services (“BDS”), particularly backhaul. Backhaul is a necessary resource for the creation of the dense thicket of small cells needed to deliver high-bandwidth wireless services.³⁷ Specifically, the outcome of the Commission’s ongoing proceeding seeking to further reform the BDS marketplace has a direct outcome on whether next-generation networks can be widely and cost-effectively deployed.³⁸ Dish, for example, has highlighted “[t]he difficulty of identifying affordable backhaul has been a key obstacle to small cell deployment.”³⁹ Accordingly, as the demand for new spectrum resources grows alongside increasing consumer demand for data, the Commission should be mindful that backhaul and other BDS resources are critical to enabling all elements of next-generation networks. The Commission should quickly conclude the BDS proceeding to ensure newly-unleashed spectrum may actually be used to support new ultra-reliable and low latency communications technology.

B. The Commission Should Make More Spectrum Available for 5G.

³⁴ See, e.g., *Nokia Use Cases* at 10; *4G Americas Recommendations* at 21.

³⁵ *Samsung White Paper* at 2.

³⁶ *4G Americas Recommendations* at 21.

³⁷ *Business Data Services in an Internet Protocol Environment*, Tariff Investigation Order and Further Notice of Proposed Rulemaking, FCC 16-54, 3 ¶ 5 (2016) (“BDS Order & NPRM”).

³⁸ See BDS Order & NPRM.

³⁹ Petition to Deny of Dish Network Corporation at 19, WC Docket No. 16-70 (filed May 3, 2016) (“Dish Petition”).

To realize the tremendous benefits outlined above in the near term, the MVDDS Coalition’s Petition presents an excellent opportunity to make spectrum available to support 5G mobile broadband technologies.⁴⁰ Allowing two-way mobile broadband in the outlined band is a practical solution, as the 12.2-12.7 GHz band spectrum meets the criteria for spectrum suitable to support 5G technology. Enacting change to the rules is consistent with Commission’s precedent of modernizing spectrum rules to remove outdated restrictions that prevent the best use of the spectrum. The deployment of the 12.2-12.7 GHz spectrum band for mobile uses would support competition and innovation, and provided much-needed relief to carriers facing capacity issues with their current spectrum holdings.

1. The 12.2-12.7 GHz Band is Well-Situated for Deployment for 5G Technology.

Considering the 12.2-12.7 GHz Band fits the Commission’s profile for 5G-ready spectrum, the Commission should not miss this opportunity to unleash more spectrum for competitive carriers. The Commission established four criteria for spectrum suitable for 5G: The spectrum must be: (1) at least 500 megahertz of contiguous spectrum; (2) have a flexible regulatory framework; (3) promote “international harmonization”; and (4) enable 5G sharing with existing uses.⁴¹ The 12.2-12.7 GHz spectrum is 500 megahertz of contiguous, high-band spectrum above 6 GHz, which has the potential to support the peak data rates necessary for 5G use.⁴² Accordingly, approving the Petition means competitive carriers can quickly and easily use this resource to provide subscribers with faster, more powerful technology they demand.

⁴⁰ See generally Petition.

⁴¹ See *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Notice of Proposed Rulemaking, 30 FCC Rcd 11878, ¶¶ 20-24 (Oct. 23, 2015) (“Spectrum Frontiers NPRM”).

⁴² See *id.* at 12014, Statement of Commissioner Michael O’Reilly (the Commission must “target additional bandwidth between 6 and 24 GHz” to facilitate deployment of 5G).

2. Current Restrictions Make Use of the 12.2-12.7 GHz Band Prohibitive For Mobile Broadband.

The Commission's rules governing use of this spectrum render it unusable for mobile broadband, which means this valuable spectrum has languished for years. As stated in the National Broadband Plan, "the failure to revisit historical allocations can leave spectrum handcuffed to particular use cases and outmoded services," while "[m]ore flexible spectrum rights will help ensure that spectrum moves to more productive uses, including mobile broadband."⁴³ The 12.2-12.7 band is certainly handcuffed;⁴⁴ the Commission should take advantage of this opportunity to allow competitive carriers to innovate and improve existing services.

3. Allowing Use of the 12.2-12.7 GHz Band for Mobile Services Would Support Commission Policies.

Allowing competitive carriers to deploy two-way mobile wireless services in the 12.2-12.7 GHz band will help to mitigate the uncompetitive effects of spectrum consolidation, which the FCC has acknowledged is occurring in the wireless industry.⁴⁵ Steady consolidation of both wireless and wireline assets by the two largest carriers threatens to increase prices for consumers,

⁴³ FCC, CONNECTING AMERICA: THE NATIONAL BROADBAND PLAN, at 78-79 (2010) ("*National Broadband Plan*"), <https://transition.fcc.gov/national-broadband-plan/national-broadband-plan.pdf>.

⁴⁴ At a time when competing demands for limited spectrum resources require hard choices, the two gigahertz of spectrum once allocated to NGSO FSS downlinks appears at odds with market demand and the public interest. The Commission should prioritize the well-documented needs of wireless carriers for 5G spectrum and act swiftly to remove the co-primary NGSO FSS allocation from the 12.2-12.7 GHz band.

⁴⁵ *See Policies Regarding Mobile Spectrum Holdings; Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Report and Order, 29 FCC Rcd 6133 ¶ 280 (June 2, 2014) (adopting "enhanced factor" review for cases where a carrier seeks to acquire additional low-band spectrum in a market in which it already holds a significant amount of low-band spectrum); *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services*, Eighteenth Report, 30 FCC Rcd 14515 ¶ 24 (WTB 2015).

increase the cost of spectrum for competitive carriers, and decrease competition.⁴⁶ Industry consolidation, which does not appear to have slowed despite the introduction of the “enhanced factor” review, results in less incentive for innovation by carriers, to the detriment of consumers. Indeed, seeking comment on whether and how to allow new services on the MVDDS spectrum through a rulemaking proceeding offers an opportunity for competitive service providers to acquire the critical input resource of spectrum they need to compete against the two dominant incumbents. Greater access to spectrum promises to increase competition in the marketplace and stimulate innovation in the market, and could help the U.S. to extend its global leadership in the wireless technology and services.⁴⁷

II. CONCLUSION

Permitting mobile broadband services in the spectrum outlined in the Petition will benefit consumers and competitive carriers alike. Allowing deployment of mobile broadband on the 12.2-12.7 GHz band will help to make new spectrum available for the development of 5G technology. Along with other important competitive policies, consumers will benefit from the high speeds and low latency promised by 5G, and competitive carriers will benefit from access to new spectrum, which will help to alleviate the uncompetitive impact of spectrum consolidation and increase competition and innovation. The Commission should therefore pursue a rulemaking to explore mobile broadband use of the 12.2-12.7 GHz band.

⁴⁶ See Reply Comments of Competitive Carriers Association, GN Docket No. 14-177, IB Docket No. 15-256, RM-11664, WT Docket No. 10-112, IB Docket No. 97-95 (filed Feb. 26, 2016).

⁴⁷ See Petition at 11.

Respectfully Submitted,

/s/ Rebecca Murphy Thompson
Rebecca Murphy Thompson
EVP & General Counsel

Steve K. Berry
CEO & President

Elizabeth Barket
Law & Regulatory Counsel

Competitive Carriers Association
805 15th Street NW, Suite 401
Washington, DC 20005
www.ccamobile.org