



OmniAir Consortium, Inc.
201 N. Union Street, Suite 110
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July 28, 2022

Marlene H. Dortch, Secretary
Federal Communications Commission
45 L Street, NE
Washington, DC 20554

Re: Public Safety and Homeland Security Bureau Seeks Comment on Waiver Requests from Intelligent Transportation System Licensees to Use C-V2X Technology in the 5.895-5.925 GHz Band (ET Docket No. 19-138)

Dear Ms. Dortch,

OmniAir Consortium, Inc. (“OmniAir”) appreciates the opportunity to provide its comments in response to the Commission’s *Public Notice* (FCC DOC 22-611): *Public Safety and Homeland Security Bureau Seeks Comment on Waiver Requests from Intelligent Transportation System Licensees to Use C-V2X Technology in the 5.895-5.925 GHz Band Proposed Rulemaking (“Joint Waiver Request Public Notice”)* in ET Docket No. 19-138.¹ The Waiver Request for which comments are sought was filed jointly by a group of automakers, state departments of transportation and equipment manufacturers (collectively, the “Joint Waiver Parties”) requesting a waiver of the Commission’s rules governing intelligent transportation system (“ITS”) operations to permit them to deploy Cellular Vehicle-to-Everything (“C-V2X”) technology immediately in the upper 30 megahertz (5.895–5.925 GHz) portion of the 5.850–5.925 GHz Band (“Upper 30 MHz Band”) and obtain equipment authorization of C-V2X radio devices.²

¹ *Public Safety and Homeland Security Bureau Seeks Comment on Waiver Requests from Intelligent Transportation System Licensees to Use C-V2X Technology in the 5.895-5.925 GHz Band Proposed Rulemaking*, Public Notice, ET Docket No. 19-138, FCC Doc No. 22-611 (rel. June 7, 2022) (“*Joint Waiver Request Public Notice*”).

² Ford Motor Company, et al., *Request for Waiver of 5.9 GHz Band Rules to Permit Initial Deployments of Cellular Vehicle-to-Everything Technology*, ET Docket No. 19-138 (filed Dec. 13, 2021) (“*Joint Waiver Request*”). Subsequently, the Joint Waiver Parties submitted a technical supplement. See also Letter from the Joint Waiver Parties to Marlene H. Dortch, Secretary, FCC, ET Docket No. 19-138 (filed Apr. 20,

OmniAir's comments also address the pending Waiver Requests filed by the Florida Department of Transportation,³ Georgia Department of Transportation,⁴ and State of Maryland State Highway Administration,⁵ as well as DriveOhio,⁶ seeking the same authority to operate C-V2X technology in the upper 30 MHz Band. On June 7, 2022, the Commission issued a *Public Notice* requesting comments on the Waiver Requests from the Florida Department of Transportation, Georgia Department of Transportation, and Maryland State Highway Administration.⁷ In addition, since the *Federal Register* publication of the *Joint Waiver Request Public Notice* on June 28, 2022,⁸ three additional waiver requests have been submitted, from the New York City of Transportation,⁹ Spoke Safety, LLC,¹⁰ and City of Arlington, TX.¹¹

OmniAir has a direct interest in this proceeding. As described below, OmniAir has implemented a conformance and interoperability certification testing program for Vehicle-to-Everything ("V2X") radio devices – including C-V2X radio devices -- operating in the 5.9 GHz

2022) (*Joint Waiver Request Supplement*). The Joint Waiver Parties consist of Audi of America, Inc., Ford Motor Company, Jaguar Land Rover, the Utah Department of Transportation, the Virginia Department of Transportation, AAEON Technology Inc., Advantech Co., Ltd., Applied Information, Inc., Cohda Wireless Pty Ltd., Commsignia, Inc., Danlaw Inc., HARMAN International Industries, Inc., Kapsch TrafficCom USA Inc., and Panasonic Corporation of North America.

³ Florida Department of Transportation, *Request for Waiver for Call Sign WQBS407*, ET Docket No. 19-138 (filed Feb. 24, 2022) and supplemented by: Email from L. Bamford, Florida Department of Transportation to T. Simmons, Branch Chief, Policy and Licensing Division, Public Safety and Homeland Security Bureau (April 22, 2022).

⁴ Georgia Department of Transportation, *Request for Waiver for Call Sign WRAT914*, ET Docket No. 19-138 (filed Sept. 13, 2021) and supplemented by: Letter from R. McMurry, Commissioner, Georgia Department of Transportation, to T. Simmons, Branch Chief, Policy and Licensing Division, Public Safety and Homeland Security Bureau, ET Docket No. 19-138 (May 24, 2022).

⁵ Maryland State Highway Administration, *Request for Waiver for Call Sign WRKJ714* (undated) and supplemented by: Maryland State Highway Administration, Email from W. Gayle, Maryland State Highway Administration to T. Simmons, Branch Chief, Policy and Licensing Division, Public Safety and Homeland Security Bureau (April 28, 2022).

⁶ DriveOhio, *Request for Waiver*, ET Docket No. 19-138 (filed June 10, 2022). DriveOhio states that it agrees to meet the same technical and operational conditions as the Joint Waiver Parties have proposed. *Id.* at 2.

⁷ *Public Safety and Homeland Security Bureau Seeks Comment on Waiver Requests from Intelligent Transportation System Licensees to Use C-V2X Technology in the 5.895-5.925 GHz Band Proposed Rulemaking*, Public Notice, ET Docket No. 19-138, FCC Doc No. 22-617 (rel. June 7, 2022).

⁸ *The Federal Communications Commission: Seeks Comment on a Request for Nationwide Waiver of Intelligent Transportation System Rules To Use C-V2X Technology in the 5.895-5.925 GHz Band*, Federal Register, 87 FR 38403 (June 28, 2022).

⁹ New York City Department of Transportation, *Request for Waiver*, ET Docket No. 19-138 (filed July 1, 2022).

¹⁰ Spoke Safety, LLC, *Request for Waiver*, ET Docket No. 19-138 (filed July 22, 2022). Spoke Safety indicates that it is a developer of wireless connectivity applications for "light mobile vehicles" (e.g., bicycles, electric scooters, motorcycles, etc.).

¹¹ City of Arlington, TX, *Request for Waiver*, ET Docket No. 19-138 (filed July 26, 2022).

Band to provide “trusted communications” for transportation. Many of the Joint Waiver Parties and the other waiver applicants are OmniAir members. In addition, OmniAir participated in earlier proceedings regarding the status and use of the 5.9 GHz Band in FCC Docket No. 13-49¹² and in FCC Docket No. 19-138.¹³

In sum, OmniAir supports the grant of the *Joint Waiver Request* and all other pending Waiver Requests as soon as possible to expedite the deployment of C-V2X operations. OmniAir also requests that the Commission issue the final C-V2X rules as soon as possible so that C-V2X radio devices can be tested and demonstrate regulatory compliance along with protocol, environmental, safety and security aspects.¹⁴ The pending Waiver Requests evidence that the public sector and private industry are ready to deploy C-V2X; however, the lack of final technical and operational rules is causing unnecessary delay in realizing the benefits of C-V2X. Granting the Waiver Requests on a one-off basis should only be a brief, interim step for realizing C-V2X deployment.

I. Description and Mission of OmniAir

Established in 2004, OmniAir Consortium is a 501(c)(6) industry association promoting interoperability and certification for Intelligent Transportation Systems (“ITS”), tolling, and Connected Vehicle technologies. OmniAir offers independent, third-party testing and certification for V2X radios and RFID tolling tags and readers, using qualified test tools and validated test cases. Based on multiple test cases developed by OmniAir and its members, OmniAir Certified® devices conform with industry standards and meet minimum protocol, interoperability and security requirements. In 2021, OmniAir launched its certification program for C-V2X radio devices, offering conformance assessment, interoperability, and security testing.

OmniAir’s 90 members are from around the world and include key stakeholders representing both public and commercial interests in the Connected Vehicle ecosystem: automotive OEMs, device manufacturers, Tier 1 Suppliers, chipset manufacturers, engineering firms, local governments, deploying agencies, test laboratories, test tool providers, and research institutions.¹⁵ In addition, currently there are six OmniAir Authorized Test Laboratories and Field Test Sites and six OmniAir Authored Test Equipment Providers.¹⁶

¹² See OmniAir Consortium, *Comments*, ET Docket No. 13-49 (filed July 7, 2016); OmniAir Consortium, *Notice of Ex Parte Meeting*, ET Docket No. 13-49 (filed April 9, 2014), OmniAir Consortium, *Comments*, ET Docket No. 13-49 (filed May 28, 2013).

¹³ See OmniAir Consortium, *Comments, ET Docket No. 19-138 (filed March 9, 2020)*.

¹⁴ See *Use of the 5.850-5.925 GHz Band*, ET Docket No. 19-138, First Report and Order, Further Notice of Proposed Rulemaking, and Order of Proposed Modification, 35 FCC Rcd 13440, at para. 55 (2020) (“5.9 GHz First Report and Order and Further NPRM”).

¹⁵ A list of OmniAir’s current members is provided in Exhibit A.

¹⁶ The lists of the current OmniAir Authorized Test Laboratories and Field Test Sites and OmniAir Authored Test Equipment Providers are provided in Exhibit B.

II. OmniAir's Activities

OmniAir was established in 2004 to develop and administrate testing and certification programs for ITS, tolling, and connected vehicle technologies. For example, OmniAir led the development of Dedicated Short-Range Communications ("DSRC") device qualification testing for the U.S. Department of Transportation's ("USDOT") Safety Pilot Model Deployment in Ann Arbor, MI. OmniAir also led the National Toll Interoperability Testing program in cooperation with the International Bridge, Tunnel and Turnpike Association ("IBTTA"), under a contract with the USDOT's Federal Highway Administration ("FHWA").

In 2012, OmniAir started its first certification program for the 6C-for-Tolling Program for tolling devices compliant with requirements based on ISO/EC 18000-6C (Type C) RFID protocol. OmniAir's certification program continues to serve the tolling industry and currently implementing multi-protocol UHF RFID operations with TDM and ISO6B-80K additions.

A. V2X Certification Program

OmniAir's V2X Certification Program is designed to verify the conformance and interoperability of Connected Vehicle technology devices to industry-defined, standards-based requirements. Companies completing certification may display the OmniAir Certified® mark to demonstrate to consumers, customers, and partners that they have created a high-quality V2X radio device for "trusted" communications that are functional, consistent, and interoperable, all critical drivers of V2X deployment. OmniAir certification plays a similar role to other certification bodies for wireless communications devices, ensuring conformance and interoperability and thus faster deployment of these vital services.

Device manufacturers seeking OmniAir certification submit their devices to an OmniAir Authorized Test Laboratory ("OATL") for certification testing. Each OATL must be an accredited ISO 17025 Test Laboratory that adheres to ISO standards for laboratory auditing and accreditation and may use only OmniAir Qualified Test Equipment "OQTE" to ensure accuracy and consistency of test results. Each OATL must prove it can execute the relevant protocol to test and verify user requirements of the underlying technology using qualified test equipment and systems. There are six entities and a total of 11 test systems that earned OmniAir Qualified Test Equipment (OQTE) status. There is one OQTE system from the United States, seven from Europe, and three from Asia.

Launched in 2017, OmniAir's first-generation Connected Vehicle Certification Program encompassed test case verification for V2X devices using DSRC wireless communications technology, including for vehicle-to-vehicle ("V2V") and vehicle-to-infrastructure ("V2I") operations.

In 2018, the FHWA awarded a contract to OmniAir to provide “Next Generation V2X Certification.” Specifically, OmniAir completed the following three tasks under the contract:

- Task #1: Identified and defined minimum security requirements for devices in the V2X ecosystem.
- Task #2: Developed a coordination process among certification members, standards development organizations (“SDOs”), and USDOT to ensure that certification test suites remain in sync with the latest standards and market developments.
- Task #3: Provided requested technical support to the USDOT (and its contractors) during the development and finalization of next-generation V2X test procedures, particularly regarding identifying new test cases for V2I radio devices and connected infrastructure.

B. V2X Certification Program – C-V2X

In fall 2020, OmniAir launched its companion Certification Program for V2X radio devices using C-V2X technologies. OmniAir’s C-V2X Certification program is structured similarly to the earlier Certification Program for DSRC: provide conformance, interoperability, and security testing and certification for C-V2X devices using many of the same test cases as were developed for DSRC certification, as well as new test cases specific to C-V2X based on key C-V2X OBU and RSU standards. To date, OmniAir’s Connected Vehicle Technical Working Group has finalized over 260 C-V2X test cases based on industry standards, as identified in the following table:

Standard	Test Elements Designation	Test Cases (#)
3GPP 36.521 & 36.523 PHY	761-OA-TSS&TP-3652#	43
SAE J3161/1 Radio	762-OA-TSS&TP-J31611	9
IEEE 1609.2 Security Services	763-OA-TSS&TP-16092	27
CAMP SCMS & Certificates (migrating to IEEE 1609.2.1)	764-OA-TSS&TP-SCMS	6
IEEE 1609.3 Network Services	765-OA-TSS&TP-16093	35
SAE J2735 Message Decoding	Incorporated in other elements	
J2945/1 → J3161/1 V2V Minimum Performance	767-OA-TSS&TP-J29451	11
J2945/1A V-V BSM Minimum Performance & Location Accuracy Field Testing	768-OA-TSS&TP-J29451A	21
RSU 4.1 Requirements	770-OA-TSS&TP-RSU41	55
SAE J2735 - MAP	782-OA-TSS&TP-MAP	28
SAE J2735 - SPaT	783-OA-TSS&TP-SPAT	24
NTCIP 1218 MIB SNMP Req	785-OA-TSS&TP-1218	9

OmniAir's C-V2X Certification Program leverages the maturity of its preceding DSRC conformance testing program and test cases. The C-V2X Certification Program is a significant step forward in bringing "trusted" C-V2X devices to market.

C. Connected Vehicle "Plugfests"

In support of its V2X Certification Programs, OmniAir hosts "Plugfests" that bring together device manufacturers and leading test labs and test equipment providers worldwide. Each OmniAir Plugfest is a week-long event where device manufacturers, test labs, and test equipment manufacturers gather to conduct bench testing and field testing (on vehicles in closed tracks) of Connected Vehicle devices. The intent is to provide an informal and nonbinding cooperative and collaborative process for participants to determine their prototype devices' readiness to seek OmniAir Certification. The Plugfests involve the following testing activities:

- Participants test in both bench and field environments for minimum radio performance
- Device and Message conformance and interoperability
- High precision location-based testing
- Message security signing and authentication using multiple root-certificates
- Standards-based compliance testing:
- Roadside Unit (RSU) SNMPv3 MIB Testing

During a Plugfest, V2X devices are rotated through conformance, interoperability, security, and field testing operated by leading test laboratories and test equipment providers from around the world. These week-long events attract 100-150 engineers and other attendees. OmniAir Plugfests continue offer to test for both DSRC-V2X and C-V2X devices, but at OmniAir's most recent Plugfest in Michigan this past May, all 25 radio devices tested were C-V2X devices. Approximately half of the devices tested were RSUs and half were OBUs.

To date, OmniAir has organized nine of its Plugfests in the United States, Canada, and Europe since 2017. Prior OmniAir Plugfests include:

- October 2017: Fremont, CA, in partnership with UL and the Metropolitan Transportation Commission
- May 2018: Detroit, Michigan in partnership with Intertek Test Laboratory and American Center for Mobility (ACM) Test Track
- October 2018: College Station, Texas, in partnership with Texas A&M Transportation Institute
- May 2019: Blainville, Quebec, in partnership with Transport Canada and Propulsion Quebec.
- September 2019: Málaga, Spain, in partnership with DEKRA Test Laboratory

- September 2020: Global Plugfest (virtual): Host test facilities included Bureau Veritas in Detroit, Michigan, and Seoul, Korea, along with DEKRA in Málaga, Spain
- June 2021: Michigan Plugfest, in partnership with Mcity - University of Michigan, and Danlaw
- November 2021: Ohio Plugfest, in partnership with DriveOhio, The Ohio State University - Center for Automotive Research, and the Beta District
- May 2022: Ann Arbor, Michigan, in partnership with the Mcity - University of Michigan

The next OmniAir Plugfest is scheduled for October 2022 and taking place again in Málaga, Spain, in partnership with DEKRA Test Laboratory. The expectation is that the majority of devices presented for bench and field testing will use C-V2X. (See the OmniAir website for future details: omniair.org).

OmniAir is planning to host its first Plugfest in Asia, in Taiwan, in October 2023, as the island nation is considering adopting OmniAir’s C-V2X Certification program, using OmniAir test cases, based on U.S. standards for the Taiwan market. Likewise, South Korea is utilizing OmniAir Certification for V2X devices for deployed in the Korean market.

D. International Developments

OmniAir has also taken multiple steps to support V2X development internationally, such as entering Memorandums of Understanding (“MOUs”) with leading industry groups in other countries. For example, OmniAir has executed two MOUs with industry associations in South Korea, and the Intelligent Transport Society of Korea (“ITS Korea”), respectively. The primary intent of these MOUs was for the parties to cooperatively develop a Connected Vehicle V2X certification program in South Korea to promote conformance, security, and interoperability based on OmniAir’s V2X Certification Programs. More specifically, the MOUs envision the parties working together in several key supporting activities, including identifying authorized test laboratories, organizing Plugfests, and implementing local requirements adapted for conformance and certification programs in each country.

In addition to ITS Korea, OmniAir has also entered into similar memoranda of understanding with ITS Canada, and the Taiwan Telematics Industry Association (TTIA) to help promote OmniAir Certification for connected vehicle technologies in these respective countries.

In addition, OmniAir recently renewed its MOU with the Brussels-based 5G Automotive Association (“5GAA”) to cooperate in the development and adoption of a global certification program for C-V2X devices. Joint activities are being investigated such as a radio module, a common test control interface for test tool automation, and V2V applications.

OmniAir has also licensed the use of its V2X test specifications to ITS Korea for use in certifying DSRC-V2X devices for the Korean marketplace. OmniAir and ITS Korea also are developing a joint certification trademark to indicate mutual recognition of certified devices;

similar licensing and joint activities with ITS Korea also are anticipated for C-V2X. Each of these international partnerships will help to drive global interoperability for Connected Vehicle technologies, including C-V2X, and help to secure and maintain US leadership for these vital services.

III. OmniAir Supports Grant of the Waiver Requests

The Commission's 2020 *Report & Order* established C-V2X as the leading Connected Vehicle wireless communications technology in the United States. The *Joint Waiver Request* and other pending Waiver Requests evidence broad public and private support for C-V2X, from state departments of transportation and other public deployers, vehicle OEMs, and device developers and manufacturers. They should be seen as a strong indication that the market is poised for C-V2X deployment. Assuming that each Waiver Request can satisfy the applicable technical requirements -- in particular, demonstrate that the requested waiver would not cause a greater potential to other non-DSRC operations in the Upper 30 MHz Band¹⁷ -- OmniAir urges the Commission to grant the Waiver Requests expeditiously.

The Joint Waiver Parties also request a waiver of the Commission's rules to enable the included device manufacturers to obtain the necessary Commission equipment authorizations for their C-V2X radio devices.¹⁸ Grant of the *Joint Waiver Request* will also enable these device manufacturers to submit their devices to OmniAir's C-V2X Certification Program where regulatory compliance is needed.

IV. OmniAir Requests FCC Issue Final C-V2X Rules Expeditiously

Final C-V2X technical rules for the Upper 30 MHz band are needed as soon as possible to provide confidence to the industry and which will then open the band for robust and nationwide C-V2X deployment. In its 2020 *Report and Order & FNPRM*, the Commission requested comments on its included *Further Notice of Proposed Rulemaking*¹⁹ for establishing critical technical and operational rules for C-V2X in the Upper 30 MHz Band, including seeking comments on channelization, geographic separation, power, antenna height, adoption of C-V2X standard, and out-of-band emission limits. Comments and Reply Comments on the *Further Notice of Proposed Rulemaking* were filed in June and July 2021, respectively.²⁰ The industry

¹⁷ *Wireless Telecommunications Bureau and Public Safety and Homeland Security Bureau Provide Guidance for Waiver Process to Permit Intelligent Transportation System Licensees to Use CV2X Technology in the 5.895-5.925 GHz Band*, Public Notice, ET Docket No. 19-138 (rel. Aug. 6, 2021) ("C-V2X Waiver Guidance").

¹⁸ *Joint Waiver Request* at 5. See also FN10.

¹⁹ *5.9 GHz First Report and Order and Further NPRM*, at paras. 151-168.

²⁰ See, e.g., Comments of 5G Automotive Association, ET Docket No. 19-138 (filed June 2, 2021) ("*5GAA Comments*"). The *5GAA Comments* noted that C-V2X investment, development and deployment had grown exponentially, but final service rules were needed to bring C-V2X to travelers in the United States and "unleash additional investment and ensure the full benefits of C-V2X are realized as quickly as possible." *Id.* at 9-10. This need has only grown more urgent in the year since the *5GAA Comments*.

urgently needs these matters to be resolved as soon as possible as the lack of certainty is hindering C-V2X development and deployment efforts.

In the interim, the Commission issued guidance in August 2021 for interested parties to seek waivers to operate C-V2X roadside units in the Upper 30 MHz Band prior to the adoption of final C-V2X rules.²¹ The guidance also addressed how to apply for waivers for Commission equipment authorization of C-V2X radio devices.²² The Instant Waiver Requests follow this guidance. While helpful and appreciated, the guidance is not a substitute for having final C-V2X rules in place. Granting one-off waiver requests cannot serve as a national set of technical and operational rules for all interested parties.

Complicating matters is the timeline adopted in the *Report & Order* for incumbent DSRC operations in the Lower 45 MHz Band to discontinue operations and move to the Upper 30 MHz in one year.²³ That date – July 5, 2021 – has now passed.²⁴ Further, the *Report & Order* proposed a two-year timeline for incumbent DSRC operations in the Upper 30 MHz Band to transition to C-V2X;²⁵ however, this two-year timeline would not begin until the issuance of the anticipated *2nd Report and Order* adopting the C-V2X rules, thus adding further – and unnecessary -- delay to C-V2X deployment. With the passage of time, C-V2X proponents are increasingly caught between a rock and a hard place.

Final C-V2X rules also are needed to enable device manufacturers to finalize C-V2X radio device technology for deployment. The lack of final rules has caused device manufacturers to hesitate in submitting their prototype devices to OmniAir's Certification Program, which, in turn, has hindered deployment. Final C-V2X rules should provide sufficient certainty to device manufacturers to finalize their designs and submit them to OmniAir for certification review. Test laboratories also require radio rules to be in place to be able to test radio devices and determine compliance. Device manufacturers are required to show hardware regulatory compliance in order to fulfill procurement requests.

The C-V2X rules also are expected to establish the timeline to transition from DSRC to C-V2X in the Upper 30 MHz Band (separate from when any transition period would begin.) As noted, the Commission has proposed a two-year transition period. The Commission indicated that the proposed transition period is based on USDOT's view that vehicle manufacturers product cycles necessitate two years lead time to ensure new V2X equipment is installed in new vehicles.²⁶ OmniAir's interest is to have this transition period, two years or otherwise, established and initiated as soon as possible, which will enable both the public and private

²¹ See generally *C-V2X Waiver Guidance*.

²² *Id.* at p. 3.

²³ *5.9 GHz First Report and Order and Further NPRM* at para. 49.

²⁴ *Public Notice*, ET Docket No. 19-138, FCC DOC DA-612 (rel. June 7, 2022).

²⁵ *5.9 GHz First Report and Order and Further NPRM* at para. 147.

²⁶ *Id.* at para. 148.

sectors to determine their plans and schedules for procurement, manufacturing, deployment, etc.

Finally, the lack of final C-V2X rules potentially puts U.S. leadership at risk. In the *Report & Order*, the Commission noted that China, in particular, has adopted C-V2X over DSRC.²⁷ It is also noted that the European Union, in 2019, had rejected DSRC as the preferred technology and was considering how to move to C-V2X deployment.²⁸ In its subsequent submission, the Joint Waiver Parties included an update of C-V2X developments internationally, noting that, in China, several automakers have or will shortly make available C-V2X equipped vehicles in that country, that at least 7000 C-V2X devices have been deployed with as many as 150,000 devices expected by 2025.²⁹ The Joint Waiver Parties also report that Canada and Mexico have recently initiated proceedings to embrace C-V2X.³⁰

The Commission stated in the *Report and Order & FNPRM*: “By designating C-V2X for ITS delivery, the U.S. is positioning itself as a global leader to be at the forefront of continued C-V2X technology development as it becomes more globally harmonized.”³¹ The final C-V2X rules are needed to help ensure that the United States retains its leadership status in C-V2X.

V. Conclusion

In sum, OmniAir expresses its strong support for granting the *Joint Waiver Request* as soon as possible. OmniAir further urges the Commission to grant the several other pending Waiver Requests on a rapid timeframe. Most important, the Commission is requested to expedite its release of the final C-V2X technical and operational rules. These rules will provide needed certainty for industry to invest in, develop and deploy C-V2X devices and services.

Respectfully submitted,

/s/ Jason M. Conley

Jason M. Conley
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/s/ Mark D. Johnson

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²⁷ *Id.* at para. 103.

²⁸ *Id.*

²⁹ *Joint Waiver Request Supplement* at p. 2.

³⁰ *Id.*

³¹ *5.9 GHz First Report and Order and Further NPRM* at para. 103.

EXHIBIT A – OmniAir Consortium Members

1. AECOM
2. ALPS Electric Co. LTD
3. Altran
4. Applied Information
5. Anritsu
6. Aptiv
7. ATOS
8. Autocrypt
9. Autotalks
10. Blackberry
11. Beontag
12. Bureau Veritas
13. Caltrans
14. Capgemini Engineering
15. Carma
16. Chemtronics
17. CISC Semiconductor GmbH
18. City of Austin
19. ClearRoad, LLC
20. Cohda Wireless America, LLC
21. Confidex
22. Continental Automotive
23. Commsigna, Inc.
24. Danlaw, Inc
25. DEKRA Testing
26. DENSO International America
27. DriveOhio
28. E-470 Public Highway Authority
29. ECOLUX
30. ESCRYPT
31. Ettifos
32. Eurofins | MET Labs
33. E-ZPass Group
34. FETC International
35. Ford Motor Company
36. Gannett Fleming
37. General Motors
38. Gentex Corporation
39. Harman
40. HNTB Corporation
41. Hitachi Solutions Ltd.
42. HwaCom
43. IBI Group
44. Integrity Security Services
45. Invengo Technology
46. iSmartways
47. Iteris
48. ITS Korea
49. IT-Telecom
50. Kapsch TrafficCom
51. KATECH
52. Keysight Technologies
53. Korea Electronics Technology Institute
54. Lear Corp
55. LG Innotek
56. Logistics and Supply Chain MultiTech R&D Centre Limited
57. Marben
58. Microsec
59. MH Corbin
60. Mitsubishi Electric
61. National Yang Ming Chiao Tung University
62. Neology
63. NI
64. Nordsys GmbH
65. North Carolina Turnpike Authority
66. North Texas Tollway Authority
67. Ohio Turnpike and Infrastructure Commission
68. Oregon Department of Transportation
69. Panasonic
70. Port Authority of New York and New Jersey
71. Qualcomm Technologies, Inc.
72. ROHDE & SCHWARZ GmbH
73. S.E.A. Datentechnik
74. SGS North America Inc.
75. Southwest Research Institute
76. Spirent Communications
77. Spoke Safety
78. Sporton International, Inc.
79. Southwest Research Institute
80. Saesol Tech Inc.
81. Star Systems International
82. Telecommunications Technology Association
83. TollPlus, LLC
84. Toyota North America
85. TransCore
86. Transportation Research Center – Ohio
87. TUV Rheinland
88. Vector North America Inc.
89. Vehicle Safety Certification Center – Taiwan
90. Wayties, Inc.
91. WSP USA
92. Yunex Traffic

EXHIBIT B

OmniAir Authorized Test Laboratories

Bureau Veritas	Detroit, MI
DEKRA	Malaga, Spain and Sterling, VA
Eurofins/MET Labs	Baltimore, MD
SGS	San Diego, CA
Telecommunications Technology Association (TTA)	Seongnam, Korea
Korea Automotive Technology Institute (KATECH)	Cheonan, Korea

OmniAir Qualified Test Equipment Providers

Keysight Technologies	Santa Rosa, CA
Nordsys GmbH	Braunschweig, Germany
Rohde and Schwarz	Seoul, Korea
S.E.A. Datentechnik GmbH	Cologne, Germany
Spirent Technologies	Berlin, Germany
Wayties	Seoul, Korea