

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

In the Matter of	)	
	)	
Amendment of the Commission's Rules	)	WT Docket No. 01-90
Regarding Dedicated Short-Range	)	
Communication Services in the 5.850-	)	
5.925 GHz Band (5.9 GHz Band)	)	
	)	
Amendment of Parts 2 and 90 of the	)	ET Docket No. 98-95
Commission's Rules to Allocate the	)	RM-9096
5.850-5.925 GHz Band to the Mobile	)	
Service for Dedicated Short Range	)	
Communications of Intelligent	)	
Transportation Services	)	

**Reply Comments of the  
Intelligent Transportation Society of America**

Robert B. Kelly  
Mark D. Johnson  
SQUIRE, SANDERS & DEMPSEY  
L.L.P.  
1201 Pennsylvania Avenue, N.W.  
P.O. Box 407  
Washington, DC 20044-0407  
(202) 626-6600

Neil D. Schuster  
President & CEO  
Intelligent Transportation Society of  
America  
400 Virginia Avenue, S.W.  
Suite 800  
Washington, DC 20024-2730  
(202) 484-4847

*Of Counsel*

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## SUMMARY

The Intelligent Transportation Society of America (“ITS America”) hereby submits its Reply Comments to the Commission’s *Notice of Proposed Rulemaking* released on November 15, 2002 in WT Docket No. 01-90 and ET Docket No. 98-95 regarding proposed licensing and service rules for the use of the frequency band at 5.850-5.925 GHz (“5.9 GHz Band”) for Dedicated Short Range Communications in the Intelligent Transportation Systems (“ITS”) Radio Service. The comments submitted in this proceeding express overwhelming support for the proposed band structure and goals for the 5.9 GHz Band: nationwide interoperability, shared access to a common frequency band by public safety and non-public safety entities and the adoption of a common transmission standard for all users and equipment. Among those commenters discussing the use of a single transmission standard, there is unanimous support for its adoption into the Commission’s Rules. These commenters also unanimously support the adoption of the proposed standard (as revised): ASTM E2213-02, Standard Specification for Telecommunications and Information Exchange Between Roadside and Vehicle Systems – 5 GHz Band Dedicated Short Range Communications (DSRC) Medium Access Control (MAC) and Physical Layer (PHY) (“ASTM E2213-02 DSRC Standard”). Support comes from a representative group of interests in the 5.9 GHz Band, including automobile manufacturers, toll authorities, national and state departments of transportation, public safety groups, local governments, equipment manufacturers, system integrators, transportation associations, engineering consultants and research institutions. Clearly, there is broad consensus that the Commission should adopt the ASTM E2213-02 DSRC Standard.

In addition to adopting the proposed standard, the Commission should also adopt rules that are consistent with that standard, without which the fundamental goal of achieving

nationwide interoperability in the 5.9 GHz Band will likely not be realized. The proposed licensing rules offered by ITS America are carefully constructed to support the effective implementation of the standard. Several commenters provide some constructive suggestions on how they believe the proposed rules can be improved. These comments discuss, for example, licensing of public safety entities, partitioning of the 5.9 GHz Band, Part 15 unlicensed operations, and other technical issues. ITS America offers herein its reply to these comments.

In sum, for the reasons in the record before the Commission, ITS America respectfully requests that the Commission adopt into its Rules the ASTM E2213-02 DSRC Standard and the proposed licensing and services rules.

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To: The Commission

**Reply Comments of  
The Intelligent Transportation Society of America**

The Intelligent Transportation Society of America (“ITS America”),<sup>1</sup> by its attorneys, hereby replies to the comments that were filed in response to the *Commission’s Notice of Proposed Rulemaking* (“NPRM”) in the above-captioned proceedings.<sup>2</sup>

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<sup>1</sup> These Reply Comments reflect the views of ITS America but do not necessarily reflect the views of individual members, some of whom have submitted separate Comments to the Commission in this proceeding and may submit Reply Comments.

<sup>2</sup> *In the Matter of Amendment of the Commission’s Rules Regarding Dedicated Short-Range Communication Services in the 5.850-5.925 MHz Band (5.9 GHz Band); Amendment of Parts 2 and 90 of the Commission’s Rules to Allocate the 5.850-5.925 GHz Band for Dedicated Short Range Communications of Intelligent Transportation Services*, WT Docket No. 01-90, ET Docket No. 98-95, RM-9096, Notice of Proposed Rulemaking and Order, 17 FCC Rcd 23136 (2002) (“NPRM”).

## **I. INTRODUCTION**

The overwhelming majority of the comments to the Commission express their strong support for the underlying concepts proposed for all DSRC-based Intelligent Transportation System (“ITS”) services in the 5.850-5.925 GHz frequency band (“5.9 GHz Band”): nationwide interoperability, shared access to a single frequency band by public safety and non-public safety entities and the adoption of a common transmission standard (ASTM E2213-02, Standard Specification for Telecommunications and Information Exchange Between Roadside and Vehicle Systems – 5 GHz Band Dedicated Short Range Communications (DSRC) Medium Access Control (MAC) and Physical Layer (PHY) (“ASTM E2213-02 DSRC Standard”). Every commenter recognizes the unique public benefits to be achieved in the band, including, among others, improving traveler safety, decreasing traffic congestion and reducing air pollution. These are the same benefits that the Commission identified in its decision to allocate the 5.9 GHz Band for DSRC-based ITS services. Moreover, not one commenter challenges the fundamental proposal that the Commission should adopt a common transmission standard; nor does any commenter suggest that the ASTM E2213-02 DSRC Standard is not the appropriate standard. Indeed, those commenters discussing the standard unanimously advocate its adoption into the Commission’s Rules. Commenters also strongly support the proposed licensing and services rules submitted by ITS America. Comments come from a broad cross section of the ITS industry and interested stakeholders: automobile manufacturers, toll authorities, national and state departments of transportation, public safety groups, local governments, equipment manufacturers, system integrators, transportation associations, engineering consultants and research institutions. The public record is thus consistent and clear: The Commission should adopt the ASTM

E22132-02 DSRC Standard (as revised)<sup>3</sup> and supporting rules for DSRC-based ITS services in the 5.9 GHz Band.

**II. THERE IS UNANIMOUS SUPPORT FOR ADOPTION OF THE ASTM E2213-02 DSRC STANDARD AS THE MOST APPROPRIATE MEANS TO ACHIEVE INTEROPERABILITY IN THE 5.9 GHZ BAND**

In addition to ITS America, the Commission received 32 comments responding to the *NPRM*, including from the U.S. Department of Transportation (“US DOT”), automobile manufacturers and their leading trade association, toll authorities operating electronic toll collection (“ETC”) systems throughout the country, public safety organizations, local governments, integrators of DSRC and ITS systems, likely manufacturers of equipment for the 5.9 GHz Band, the national association representing all state departments of transportation, consultants and transportation research institutions. All commenters discussing the ASTM E2213-02 DSRC Standard support the standard as revised as the best and most appropriate means to realize nationwide interoperability in the band. There is also consistent support for the licensing and service rules proposed by ITS America. This record leaves little doubt that the public interest clearly and unequivocally supports adopting the ASTM E2213-02 DSRC Standard and the proposed supporting rules.

The US DOT forcefully explains how the lack of nationwide interoperability currently confronting the ITS industry will be alleviated by adoption of the ASTM E2213-02 DSRC Standard in the 5.9 GHz Band. For heavy trucks and other commercial vehicles, for example, broader deployment of electronic safety screening systems “ha[ve] been hampered by the lack of

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<sup>3</sup> As discussed below in Section IV, the standards writing group (“ASTM DSRC Standards Writing Group”) that has been developing the ASTM E2213-02 DSRC Standard under the auspices of the American Society of Testing and Materials (“ASTM”), an ANSI-accredited

a national DSRC standard, the relatively modest capabilities of current technology, and the absence of any obvious or recurring ‘payoff’ arising from existing safety applications.”<sup>4</sup> ETC deployments have been plagued by incompatibility and/or interference because of the deployment by individual toll or regulatory authorities of proprietary systems in limited geographic areas.<sup>5</sup> Thus, according to US DOT, advanced safety applications will only be effectively developed and marketed where national interoperability exists.<sup>6</sup> Moreover, permitting shared, non-public safety use of the 5.9 GHz Band with public safety will “broaden the market” such that equipment and service developers will have the incentive to develop both public safety and non-public safety applications, thus permitting both to benefit from the resulting economies of scale.<sup>7</sup> The foundation for realizing these several goals, according to US DOT, is the adoption by the Commission of the ASTM E2213-02 DSRC Standard.<sup>8</sup>

Strong support for adopting the ASTM E2213-02 DSRC Standard comes from the several leading automobile manufacturers submitting comments. For example, the Alliance of Automobile Manufacturers (“AAM”), whose members – BMW, DaimlerChrysler, General Motors, Mazda, Mitsubishi Motors, Nissan, Porsche, Toyota and Volkswagen – are among the largest passenger and light truck manufacturers in the world, “supports the fundamental need for

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standards-setting organization, have updated the standard. These revisions will be balloted within ASTM for approval, with the revised standard document available thereafter.

<sup>4</sup> Comments of U.S. Department of Transportation (“US DOT Comments”) at 2-3.

<sup>5</sup> *Id.* at 3.

<sup>6</sup> *Id.* at 3-4.

<sup>77</sup> *Id.* at 4.

<sup>8</sup> *Id.* at 4-5.

nationwide interoperability for DSRC applications and fully supports the efforts to ensure that the 5.9 GHz [Band] is interoperable throughout the United States through a single set of DSRC standards.”<sup>9</sup> AAM agrees with ITS America that shared use of the band “will ensure that [it] is put to its best and highest use for the greatest public benefits,” and allowing such mixed use will lead to earlier and wider deployment of DSRC devices and services.<sup>10</sup> AAM also supports achieving nationwide interoperability in the band through the adoption of the ASTM E2213-02 DSRC Standard.<sup>11</sup> Because automobiles have a significantly longer life cycle than, for example, consumer electronics, and vehicles may travel from one region of the country to another, AAM writes that the vehicle manufacturing industry needs to be assured of long-term technical stability of the base DSRC technology, which, according to AAM, is represented by the proposed standard.<sup>12</sup> Consistent supporting comments in the individual filings of BMW and Nissan are further evidence of the automobile industry’s commitment to using the 5.9 GHz Band for DSRC-based ITS services.<sup>13</sup>

Comments from entities offering electronic toll collection (“ETC”) services also express strong support.<sup>14</sup> All of these commenters have deployed or support ETC activities currently

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<sup>9</sup> Comments of the Alliance of Automobile Manufacturers (“AAM Comments”) at 2.

<sup>10</sup> *Id.* at 8-9.

<sup>11</sup> *Id.* at 10.

<sup>12</sup> *Id.* at 9-11.

<sup>13</sup> *See* Comments of BMW Group (“BMW Comments”); Comments of Nissan Motor Co., Ltd. (“Nissan Comments”).

<sup>14</sup> *See generally* Comments of Delaware Department of Transportation (“Delaware DOT Comments”); Comments of E-470 Public Highway Authority (“E-470 Comments”); Comments of E-Z Pass Interagency Group (“E-Z Pass IAG”); Comments of International Bridge, Tunnel & Turnpike Association (“IBTTA Comments”); Comments of Maine Turnpike Authority (“Maine

operating in the 902-928 MHz band (“900 MHz Band”) on highways, bridges and tunnels. The E-Z Pass Interagency Group (“E-Z Pass IAG”) writes: “[W]e firmly support the ASTM E2213-02 DSRC Standard, and urge the FCC to adopt it as an open, non-proprietary wireless transmission standard for DSRC applications in the 5.9 GHz band.”<sup>15</sup> Moreover, E-Z Pass IAG, an umbrella organization representing 21 state, regional and local transportation authorities and others operating the E-Z Pass ETC system, the world’s largest, writes that “[w]hile IAG members intend to migrate operations over time to the 5.9 GHz band, that will necessarily be an extended implementation process requiring dual, transitional operations in the both 900 MHz and 5.9 GHz for the foreseeable future.”<sup>16</sup> According to the Delaware Department of Transportation, a member of the E-Z Pass IAG, the promise of the 5.9 GHz Band is a true nationwide system of ETC deployments that are “interoperable, expandable [and] versatile.”<sup>17</sup>

Likely equipment suppliers for the 5.9 GHz Band also express strong support for adopting the ASTM E2213-02 DSRC Standard. Support comes from Mark VI and TransCore, two of the leading suppliers of ETC transponders in the United States.<sup>18</sup> TransCore writes that, in addition to “curing” the existing problems due to a lack of national interoperability, adoption of the ASTM E2213-02 DSRC Standard by the Commission, “will speed market acceptance,

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Turnpike Comments”); Comments of MTA Bridges and Tunnels (“MTA Comments”); Comments of New York State Thruway Authority (“NYS Thruway Comments”); Comments of North Texas Tollway Authority (“North Texas Tollway Comments”); Comments of Port Authority of New York & New Jersey (“Port Authority Comments”).

<sup>15</sup> E-Z Pass IAG Comments at 8.

<sup>16</sup> *Id.* at 12.

<sup>17</sup> Delaware DOT Comments at 1.

<sup>18</sup> *See* Comments of Mark IV Industries, Ltd., I.V.H.S. Division (“Mark IV Comments”); Comments of TransCore (“TransCore Comments”).

create additional incentives for manufacturers to design and develop mass-market – and niche market – equipment, and provide a platform upon which to support future innovative products.”<sup>19</sup> Intersil, a manufacturer of complete wireless chipsets, and Sirit Technologies, another likely manufacturer of DSRC devices, also express their strong support for shared use of the band and adoption of the ASTM E2213-02 DSRC Standard as the best means to achieve interoperability.<sup>20</sup>

Generally supportive comments were also received from Siemens Transportation System (“Siemens”), an integrator of commercial telecommand and data telemetry control systems for vehicular control systems, as well as 3M, a manufacturer of a variety of vehicle related safety products.<sup>21</sup>

Additional supporting comments were received from national transportation associations,<sup>22</sup> research institutions,<sup>23</sup> public safety organizations,<sup>24</sup> local governments,<sup>25</sup>

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<sup>19</sup> TransCore Comments at 4.

<sup>20</sup> *See* Comments of Sirit Technologies Incorporated (“Sirit Comments”) at 2-3.

<sup>21</sup> *See* Comments of Siemens Transportation System (“Siemens Comments”); Comments of 3M (“3M Comments”).

<sup>22</sup> *See* Comments of the American Association of State Highway and Transportation Officials (“AASHTO Comments”); Comments of the Association of American Railroads (“AAR Comments”); Comments of International Municipal Signal Association (“IMSA Comments”).

<sup>23</sup> *See* Comments of Johns Hopkins Applied Physics Laboratory (“Johns Hopkins Comments”); Comments of the Advanced Highway Maintenance and Construction Technology Research Center, University of California, Davis (“Advanced Highway Maintenance Center Comments”).

<sup>24</sup> *See* Comments of Public Safety Wireless Network Program (“PSWN Comments”).

<sup>25</sup> *See* Comments of National Association of Telecommunications Officers and Advisors/National League of Cities (“NATOA/Cities Comments”).

emergency responders<sup>26</sup> and consultants to the American Society of Testing and Materials (“ASTM”),<sup>27</sup> the ANSI-accredited standards-setting organization through which the ASTM E2213-02 DSRC Standard was developed.

### **III. FINAL RULES SHOULD SUPPORT USE OF ASTM E2213-02 DSRC STANDARD**

Adopting the ASTM E2213-02 DSRC Standard is but the first step toward realizing the unique public benefits in the 5.9 GHz Band. The standard is not sufficient in and of itself to ensure that true nationwide interoperability is achieved. It is therefore equally important that the Commission adopt rules that are consistent with the standard. The proposed licensing and service rules submitted by ITS America are carefully constructed to support the effective implementation of the standard and, ultimately, to achieve interoperability in the band. For example, site-by-site licensing best reflects the technical and administrative characteristics of DSRC-based ITS services. The record before the Commission overwhelmingly supports the adoption of the rules proposed by ITS America. ITS America offers below its reply to several suggested changes to these proposed rules.<sup>28</sup>

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<sup>26</sup> See Comments of the National Emergency Numbering Association (“NENA Comments”).

<sup>27</sup> See Comments of ARINC, Inc. (“ARINC Comments”); Comments of Highway Electronics (“Highway Electronics Comments”).

<sup>28</sup> AAM suggests that while the Commission should adopt Layers 1 and 2 of the ASTM E2213-02 DSRC Standard, it is premature to adopt the proposed band plan until the upper layers of the standard are finalized. AAM Comments at 11-12. As ITS America has noted previously, these upper layers do not affect the radio frequency issues within the Commission’s jurisdiction; therefore, it is not recommended that adoption of the standard as revised be delayed until these upper layers are completed.

## A. Licensing

The majority of commenters support licensing of Roadside Units on a site-by-site basis as proposed by ITS America.<sup>29</sup> AAM notes that when authorizing ETC operations in the 900 MHz Band, the Commission determined that both the nature of the anticipated services (*i.e.*, ETC) and the small size of the service areas require that a geographic wide area license granted on an exclusive basis are inappropriate.<sup>30</sup> Based on the successful experience of ETC and other applications in the 900 MHz Band, Mark IV also advocates site-by-site licensing for the 5.9 GHz Band: “The current shared use [of] site-by-site licensing of ETC, [commercial vehicle operations], traffic monitoring, border crossing and other ITS systems works well because they cover small isolated coverage areas, must be located at predetermined fixed points along highways and other thoroughfares, and are not deployed solely or even predominantly in metropolitan areas.”<sup>31</sup> These same conditions will also apply to operations in the 5.9 GHz Band. Also, the John Hopkins University Applied Physics Laboratory (“Johns Hopkins”), a participant in the ASTM DSRC Standard Writing Group, writes that “DSRC is envisioned to encompass a multitude of services, provided by a number of enterprises, each with localized communications

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<sup>29</sup> AASHTO Comments at 4; Comments of ARINC, Inc. (“ARINC Comments”) at 12; Delaware DOT Comments at 2; E-Z Pass IAG Comments at 9; IBTTA Comments at 4; Johns Hopkins Comments at 14; Maine Turnpike Comments at 2; Mark IV Comments at 9; MTA Comments at 5; National Radio Astronomy Laboratory (“NRAO Comments”) at 1-2; NYS Thruway Comments at 8; North Texas Tollway Comments at 1; Port Authority Comments at 3; Sirit Comments at 3; TransCore Comments at 7.

<sup>30</sup> AAM Comments at 9 (citing *In the Matter of Amendment of Part 90 of the Commission’s Rules to Adopt regulations for Automatic Vehicle Monitoring Systems*, Report and Order, PR Docket No. 93-61, 10 FCC Rcd 4695, 4731 (“In a shared use environment, it is important that applicants and other co-channel users know exactly where systems are located if they are to avoid interference.”)).

<sup>31</sup> Mark IV Comments at 9.

zones. In many cases, DSRC operations, and the associated communications zones may be restricted to property boundaries of the private enterprise (i.e., restaurants, gas stations, parking facilities, banks, etc.).”<sup>32</sup> Thus, this localized provisioning of service is most consistent with site-by-site licensing on a first-come/first-served basis.<sup>33</sup>

A few commenters, however, suggest that public safety and governmental licensees be authorized to use a geographic licensing scheme, such as on a statewide and/or regional basis.<sup>34</sup> For example, Siemens suggests that a geographic area license would be appropriate for metropolitan transit agencies and other public safety services that deploy a large number of On-Board and Roadside Units that cover a large geographic area crossing local jurisdictional lines.<sup>35</sup> NATOA/National League of Cities recommends that licensing for public safety users be done by state, metropolitan or district area.<sup>36</sup>

Geographic area licensing, whether for public safety or non-public safety users, is more appropriate where a particular service requires high power, 360-degree coverage, such as cellular

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<sup>32</sup> John Hopkins Comments at 14.

<sup>33</sup> In its July 2002 submission, ITS America provides a more complete description of the characteristics of DSRC-based ITS services and the appropriateness of using site-by-site licensing. *See Ex Parte Comments of the Intelligent Transportation Society of America: Status Report and Recommendations for Licensing and Service Rules for the DSRC Spectrum in the 5850-5925 MHz Band* (“July 2002 Ex Parte Comments”) at 48-53.

<sup>34</sup> *See, e.g.*, NATOA/Cities Comments at 9-10; PSWN Comments at 9-10, 12; Siemens Comments at 5-6; 3M Comments at 3. It should be noted, however that PSWN does support some site-by-site licensing, if possible. PSWN Comments at 9.

<sup>35</sup> Siemens Comments at 6.

<sup>36</sup> NATOA/Cities Comments at 10. (NATOA/Cities also suggests that private users be licensed by metropolitan statistical area and rural services areas. *Id.* As ITS America has discussed previously (Comments of Intelligent Transportation Society of America (“ITS America Comments”) at 12-15), geographic area licensing – regardless of how such areas are defined – are wholly inappropriate for public safety or non-public safety licensees in the 5.9 GHz Band.)

systems for real-time voice communications. By contrast, DSRC-based ITS services will use line-of-sight transmissions and over short distances (less than 1000 meters). Licensed operations can be closely adjacent to one another or even overlapping. Any proposed type of geographic area licensing is not consistent with these service attributes. Site-by-site licensing is therefore the best and most appropriate licensing method for all potential licensees.

Site-by-site licensing is the only licensing method consistent with the ASTM E2213-02 DSRC Standard. The standard contemplates licensees operating within identified, localized “communications zones” transmitting at ranges of 1000 meters or less. In specific instances, a frequency coordinator will authorize the overlapping of individual communications zones. All licensees will monitor the Control Channel (#178) and be licensed to operate on discrete Service Channels elsewhere in the band. The standard does not offer to any licensee – public safety or non-public safety – exclusive rights to any portion of the 5.9 GHz Band. Awarding licenses by defined geographic area would render the ASTM E2213-02 DSRC Standard ineffective and, consequently, defeat achieving nationwide interoperability in the band.

Site-by-site licensing will also maximize spectrum efficiency. Licenses will be available to the maximum number and types of entities – both public safety and non-public safety. Individual licenses can be closely located next to each other, and even overlapping. Geographic area licensing, in contrast, will create artificial areas of exclusivity, which, according to Johns Hopkins, would ultimately inhibit the further deployment of other services: “[Geographic licensing] would be a windfall for the luck[y] few that get in first, and an economic barrier or burden for all that follow.”<sup>37</sup> Future licensees providing new and unforeseen services would be denied this opportunity, unless they are willing to pay a steep entrance fee to those few with

access to the band. Such a result is not consistent with the public safety benefits to be gained nor is it consistent with the Commission's policy to maximize spectrum efficiency through licensing and other techniques.

State, regional or other geographic area licensing would also not provide the mechanism for frequency coordination that is available under a site-by-site regime. Frequency coordination is especially important to ensure that co-primary incumbents not suffer harmful interference from new deployments. If allegations of harmful interference are raised, there needs to be a means by which the potential source can be identified. The suggested forms of geographic area licensing do not provide these protections. ITS America recognizes that some licensees, especially certain public safety licensees such as toll and freeway authorities, transit agencies, and others, will need to place multiple Roadside Units across a large geographic area that will likely cross several jurisdictional boundaries. For these reasons, ITS America proposed that the Commission adopt a "ribbon" or "corridor" licensing approach for just these instances. For example, a toll authority under this scheme could seek to place many Roadside Units alongside the full length of its roadways under a single license. A single license application would be used, but the applicant would identify the individual transmission sites for purposes of frequency coordination.<sup>38</sup> Several comments from the ETC industry, many of which operate hundreds of miles of roadways, support this approach. For these and other reasons discussed previously, site-by-site licensing is the best and most appropriate licensing regime for the 5.9 GHz Band.

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<sup>37</sup> Johns Hopkins Comments at 14.

<sup>38</sup> Any claims that the administrative burden likely to result from site-by-site licensing will be so great that it is essentially unworkable are misplaced. The successful implementation of the Commission's Universal License System ("ULS") belies such claims. Frequency coordinators should be able to use ULS or other, similar databases with relative ease in the 5.9 GHz Band.

## **B. Shared Access or Partitioning of 5.9 GHz Band**

As described above, the ASTM E2213-02 DSRC Standard and supporting rules contemplate shared access by all users to the 5.9 GHz Band. A fundamental concept underlying the ASTM E2213-02 DSRC Standard and supporting band structure is shared use of the channels by all users, public safety and non-public safety. All users will monitor the Control Channel (#178) for public safety messages or instructions to move to a designated Service Channel to conduct a transaction or other activity. Thus, a single On-Board Unit installed, for example, in a vehicle will be able to receive both public safety and non-public safety related messages. This sharing of frequencies and devices is, ITS America, submits the most appropriate way to achieve true nationwide interoperability, but also to ensure the quickest and most comprehensive deployment of DSRC-based ITS services.

The comments from US DOT aptly describe this vision. First, an application with a clear commercial value will be more likely to attract investment, while a public safety application will not.<sup>39</sup> Second, voluntary standards, in and of themselves, have not have been sufficient to create interoperable devices and the broadest possible market for devices and services.<sup>40</sup> Third, public safety applications require national interoperability.<sup>41</sup> By adopting the ASTM E2213-02 DSRC Standard, including its requirement of shared access to the band, the Commission can ensure that the largest possible market for DSRC devices and services will result; thus, the development and deployment of public safety services in the band can “piggyback” on private investment and the

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<sup>39</sup> US DOT Comments at 3.

<sup>40</sup> *Id.*

<sup>41</sup> *Id.*

greater, combined economies of scale.<sup>42</sup> Virtually all the remaining commenters accept this vision and, accordingly, express overwhelming support in the record for the shared access band structure.<sup>43</sup>

The Public Safety Wireless Network Program (“PSWN”), a federally funded program to plan and foster interoperability among public safety wireless networks, recommends that if there is to be private and non-public safety entities licensed in the 5.9 GHz Band, then the band should be partitioned with at least 50 MHz available to support public safety operations.<sup>44</sup> This step is necessary, according to PSWN, to separate the different applications to minimize the risk of harmful interference to public safety users.<sup>45</sup> First, any partitioning of the 5.9 GHz Band is inconsistent with the ASTM E2213-02 DSRC Standard and its shared access band structure. Second, PSWN offers no rationale or evidence for why the 50/20 MHz split is the best split. If it is not, actual deployments – both public safety and non-public safety – will face unnecessary obstacles with spectrum use and efficiencies not maximized. Public safety licensees would also

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<sup>42</sup> *Id.* at 4.

<sup>43</sup> *See, e.g.*, AAM Comments at 2 (“[AAM] recognizes the expectation that commercial users and services, while coexisting on the DSRC band with safety services on a non-interference basis, will play an important role in subsidizing and, therefore, expediting the deployment, and, likewise, the growth in effectiveness of associated DSRC-based safety systems.”); AASHTO Comments at 3 (“While the primary use of the band will be for Public Safety Services, it is important to also allow private applications within the DSRC Service. The justifications include economies of scale resulting from the greater market for devices and systems. Users may be reluctant to purchase a service which offers only Public Safety related messages, but they would buy a service which also allows automated payment, access to the internet and various data acquisition services.”).

<sup>44</sup> PSWN Comments at 5-6. Another commenter, BD Industries, also suggests that public safety and non-public safety entities should not share the same channels in the band. *See* Comments of BD Industries (“BD Industries Comments”).

<sup>45</sup> PSWN Comments at 6.

not benefit from the potential economies of scale that would otherwise be available from combining the public safety and non-public safety markets. Finally, partitioning the band in any manner, even if the Commission were to adopt the ASTM E2213-02 DSRC Standard, would not result in interoperability, and its attendant significant public benefits.<sup>46</sup>

### C. Part 15 Unlicensed Operations

ITS America proposed that On-Board Units, including those not associated with a particular licensee, be “licensed-by-rule” pursuant Section 307(3) of the Communications Act<sup>47</sup> rather than as “unlicensed” devices under Part 15 of the Commission’s Rules.<sup>48</sup> The majority of commenters supports this approach and rejects any use of Part 15.<sup>49</sup> The licensed-by-rule regime is consistent with the technical characteristics of these devices and will speed their deployment

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<sup>46</sup> A few commenters suggest certain other “exceptions” to the proposed band plan and applicability of the standard. For example, Siemens proposes that a transit system operating a private, internal and non-commercial wireless communications network not be required to be interoperable. Siemens Comments at 7-8. Under these conditions, according to Siemens, a potential licensee would only need to conform to the basic power, channelization, and spurious and out-of-band emission requirements. *Id.* At the inception of service, licensees in the 5.9 GHz Band should be required to comply with the full complement of rules ultimately adopted by the Commission. Granting exceptions now would undermine the goal of achieving nationwide interoperability. *See also* Sirit Comments at 2-3 (suggesting that reserved 5 MHz of band at 5.850-5.855 GHz be utilized for applications that do not fully adhere to the ASTM E2213-02 DSRC Standard); TransCore Comments at 8 (suggesting that Commission could permit low-cost and simple devices that do not implement all the capabilities of the standard to operate so long as they do not interfere with other DSRC devices.)

<sup>47</sup> 47 USC § 307(e). This approach is more fully explained by ITS America in its July 2002 submission. *See July 2002 Ex Parte Comments* at 53-56.

<sup>48</sup> 47 CFR Part 15.

<sup>49</sup> *See, e.g.*, AAM Comments at 14; AASHTO Comments at 7; ARINC Comments at 12; E-Z Pass IAG Comments at 12; IBTTA Comments at 6-7; IMSA Comments at 3-4; Intersil Comments at 12-13; Johns Hopkins Comments at 12-13; Maine Turnpike Comments at 2; Mark IV Comments at 10; MTA Comments at 5; NYS Thruway Comments at 10; Nissan Comments at 7; North Texas Tollway Comments at 2; Port Authority Comments at 3; TransCore Comments at 8.

by doing away with unnecessary individual licensing requirements. Thus, this licensing structure will result in the quickest and most comprehensive deployment of these devices in millions of vehicles produced and sold in the United States.

Three commenters, however, suggest that On-Board Units, especially those not associated with a particular license, be authorized instead as “unlicensed” devices under Part 15.<sup>50</sup> Authorizing the operations of On-Board Units (or for Roadside Units) under Part 15 is inappropriate for the 5.9 GHz Band because these rules do not provide the needed technical protections that are available under the Commission’s licensed-by-rule regime. Part 15 permits unrestricted use of a device consistent with a specified transmission power level, under the sole caveat that they not interfere with the operations of a licensee. Thus, a Part 15 device can otherwise operate and transmit without regard to other limitations that may be necessary to co-exist with licensed services also operating in a particular band. Conversely, the “licensed by rule” regime would require not only that On-Board Units comply with transmission power limits, but also that they follow specific rules regarding timing, intervals and length of transmissions, especially on the Control Channel, as found in the ASTM E2213-02 DSRC Standard and the proposed supporting rules. Thus, the “licensed-by-rule” regime offers the needed administrative flexibility for deployment and the sufficient technical limits to operate successfully in the band. The Commission should therefore reject any suggestion for authorizing “unlicensed” operations of On-Board Units under Part 15.

#### **IV. STATUS OF ASTM E2213-02 DSRC STANDARD**

Currently, the ASTM DSRC Standards Writing Group is updating the ASTM E2213-02 DSRC Standard to take into account recent developments in the underlying IEEE 802.11

foundation standard as well as further refinements proposed by participants from the automobile industry. Proposed changes include: (1) the use of an Ad Hoc mode as the default mode of operation on the Service Channels and the only mode on the Control Channel; (2) the addition of an Annex that describes the receiver power and antenna calibration factors; (3) a new function to generate randomly MAC addresses for controlling access and confidentiality; (4) the redesignation of Channel 172 for high-availability and low latency communications and not reserved exclusively for vehicle-to-vehicle communications;<sup>51</sup> and (4) updates to power and EIRP limitations on certain channels. It is expected that these recommendations will be distributed for approval by the ASTM membership later this month with balloting concluded the end of May or early June. The updated standard will be provided to the Commission for its consideration as soon as the balloting is completed. Testing scheduled to commence this summer may also reveal additional needed changes. For these reasons, ITS America repeats its recommendation in its initial comments that any Commission rule adopting the standard should also include a provision to reference updates approved by ASTM.<sup>52</sup>

## **V. OTHER ISSUES**

### **A. Vehicle-to-Vehicle Communications**

AAM and Nissan have raised an issue regarding the most appropriate classification of vehicle-to-vehicle communications. Both commenters note that such “*ad hoc*” communications will not be associated with a particular licensed Roadside Unit, but will occur between On-Board

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<sup>50</sup> NATOA/Cities Comments at 11; 3M Comments at 3; BD Industries Comments.

<sup>51</sup> ITS America described this change in its initial comments. ITS America Comments at 21.

<sup>52</sup> *Id.* at 12 and Appendix A.

Units authorized under the Commission’s “licensed-by-rule” regime.<sup>53</sup> Nissan, in particular, suggests that vehicle-initiated communications are effectively public safety communications, although they will not be transmitted by a qualified public safety entity.<sup>54</sup> ITS America concurs that these vehicle-to-vehicle communications are best treated as public safety communications. For example, data messages between vehicles as part of a collision avoidance system at intersections or on highways have a clear public safety benefit whether or not they fall under the definitions available to the Commission.<sup>55</sup>

### **B. Adjacent, Out-of-Band Emissions from FSS Earth Stations**

PanAmSat has raised an issue regarding the potential interference to DSRC-based ITS services in the 5.9 GHz Band from out-of-band emissions from FSS earth stations operating in the adjacent 5.925-6.425 GHz band (“Satellite C Band”).<sup>56</sup> It is concerned that the low power transmissions from DSRC stations will be susceptible to interference from its and others’ out-of-band emissions caused by their satellite uplink transmissions. Thus, PanAmSat recommends that DSRC Roadside Units be required to withstand the noise floor created by these out-of-band emissions from their FSS earth stations transmitting in the Satellite C Band.<sup>57</sup>

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<sup>53</sup> See AAM Comments at 9; Nissan Comments at 3-5.

<sup>54</sup> Nissan Comments at 3-5.

<sup>55</sup> Several comments from the ETC community also request that the Commission deem their operations as qualified “public safety radio services.” See, e.g., IBTTA Comments at 5; MTA Comments at 4. ETC operators and their communications with the traveling public, emergency vehicles, police, fire and medical personnel have a clear public safety benefit. Thus, ETC operators should qualify as “public safety radio services” under the Commission’s broader definition found in Section 309(j)(2) (47 USC § 309(j)(2)).

<sup>56</sup> Comments of PanAmSat (“PanAmSat Comments”) at 1-2.

<sup>57</sup> *Id.* at 3.

No such service rules for the 5.9 GHz Band are necessary. Such a rule would be highly unusual. ITS America is unaware of any precedent – and PanAmSat cites none– where a service has been required to accept out-of-band emissions from an adjacent band as a pre-condition of operation. It is also not apparent that the Commission Rules cited by PanAmSat establish a noise floor.<sup>58</sup>

The ASTM DSRC Standards Writing Group considered, and took measures to mitigate, the potential interference from in-band and out-of-band emissions from the Satellite C Band. Thus, for example, the Control Channel for the 5.9 GHz Band is located in the middle of the band (at 5.885-5.895 GHz). The channel adjacent to the lower end of the Satellite C Band, Channel 184 (at 5.925-5.925 GHz), will likely be used most often in cities, away from existing satellite uplinks located in areas away from population centers. (The analysis also suggests that any out-of-band emissions from these FSS earth stations will likely be no greater than that from the higher power operations in Channel 184.) The uplinks in the Satellite C Band utilize a very narrow emission footprint on the ground. Thus, the potential interference area is very small. Roadside Units can also be located outside of any potential satellite uplink interference area. All of these elements should mitigate against potential interference from these FSS earth stations.

Finally, this issue presents yet another reason why site-by-site licensing and frequency coordination is the most appropriate licensing method for the 5.9 GHz Band. Incumbent FSS earth stations, whether those in the 5.9 GHz band or in the adjacent Satellite C Band, would be considered in any coordination analysis conducted by frequency coordinators when reviewing an application for a Roadside Unit. Given the lower power and short transmission range of these Roadside Units, coordinators should be able to easily locate Roadside Units away from

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<sup>58</sup> PanAmSat cites 47 CFR §§ 25.202(f), 25.209, 25.211, 25.212. PanAmSat Comments at 2, 3.

incumbent FSS earth stations. (Geographic area licensing would not provide the benefits inherent from frequency coordination to either DSRC or FSS licensees.) Any in-band or out-of-band emissions should be relatively localized, and can be managed through the frequency coordination process.<sup>59</sup>

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<sup>59</sup> A study commissioned by the US DOT found that potential interference from existing FSS Earth Stations operating in the 5.9 GHz Band would be very localized and can be coordinated with DSRC sites. US DOT Comments at 8-9. The potential for harmful interference from out-of-band emissions from the adjacent Satellite C Band should present even less of a problem.

## VI. CONCLUSION

The public record before the Commission unanimously and unambiguously advocates the adoption of the ASTM E2213-02 DSRC Standard as the best and most appropriate means to achieve nationwide interoperability in the 5.9 GHz Band. The supporting licensing and service rules adopted by the Commission should also be consistent with and support the use of the standard in the band. If accepted by the Commission, these recommendations will result in the unique public benefits envisioned for the band.

Respectfully submitted,

By: /s/ Neil D. Schuster

Robert B. Kelly  
Mark D. Johnson  
SQUIRE, SANDERS & DEMPSEY  
L.L.P.  
1201 Pennsylvania Avenue, N.W.  
P.O. Box 407  
Washington, DC 20044-0407  
(202) 626-6600

Neil D. Schuster  
President & CEO  
Intelligent Transportation Society of  
America  
400 Virginia Avenue, S.W.  
Suite 800  
Washington, DC 20024-2730  
(202) 484-4847

*Of Counsel*

April 15, 2003

## CERTIFICATE OF SERVICE

I, Mark D. Johnson, hereby certify that on this 15<sup>th</sup> day of April 2003, I caused copies of the "Reply Comments of the Intelligent Transportation Society of America" to be delivered to the following persons and entities by first-class mail, postage prepaid.

By: /s/ Mark D. Johnson  
Mark D. Johnson

Alliance of Automobile Manufacturers  
1401 H Street, NW  
Suite 900  
Washington, DC 20005

John Horsley  
Executive Director  
American Association of State Highway  
and Transportation Officials  
444 North Capitol Street, NW  
Suite 249  
Washington, DC 20001

John C. Smith  
Secretary and General Counsel  
ARINC Incorporated  
2551 Riva Road  
Annapolis, MD 21401

Thomas J. Keller  
Association of American Railroads  
50 F Street, NW  
Washington, DC 20001

Jeffrey P. Thorn  
BD Industries  
950 Washington Avenue  
Albany, NY 12203

Karl-Heinz Ziwica  
General Manager  
Environmental Engineering  
BMW Group  
1 BMW Plaza  
Montvale, NJ 07645-1866

PJ Wilkins  
Toll Operations Administrator  
Delaware Department of Transportation  
800 Bay Road  
PO Box 778  
Dover, DE 19903

Dan L. Baker  
Director of Information Technology  
E-470 Public Highway Authority  
22470 E. 6<sup>th</sup> Parkway  
Suite 100  
Aurora, CO 80018

E-Z Pass Interagency Group  
c/o Ramsey L. Woodworth, Esq.  
SHOOK, HARDY & BACON, LLP  
600 14<sup>th</sup> Street, NW  
Suite 800  
Washington, DC 20005-1004

Roger O'Connor  
Highway Electronics  
PO Box 122  
Trabuco Canyon, CA 92678

Timothy J. McGuckin  
Director, Technology Programs  
International Bridge, Tunnel & Turnpike  
Association  
1146 19<sup>th</sup> Street, NW  
Suite 800  
Washington, DC 20036

Intersil Corporation  
c/o Mitchell Lazarus, Esq.  
FLETCHER, HEALD & HILDRETH, P.C.  
1300 North 17<sup>th</sup> Street,  
11<sup>th</sup> Floor  
Arlington, VA 22209

International Municipal Signal Association  
c/o Martin W. Bercovici, Esq.  
Keller and Heckman, LLP  
1001 G Street, NW  
Suite 500W  
Washington, DC 20001

Robert Sorrano  
Strategic Systems Department  
Johns Hopkins Applied Physics Laboratory  
11100 Johns Hopkins Road  
Laurel, MD 20723-6099

Jonathan Arey, Esq.  
Staff Attorney  
Maine Turnpike Authority  
430 Riverside Street  
Portland, ME 04103

Mark IV Industries, LTD, IVHS Division  
c/o George Y. Wheeler, Esq.  
Holland & Knight LLP  
2099 Pennsylvania Avenue, NW  
#100  
Washington, DC 20006

Michael C. Ascher  
President  
MTA Bridges and Tunnels  
Robert Moses Building  
Randall's Island  
New York, NY 10035-0035

Executive Director  
National Association of  
Telecommunications Officers and Directors  
8405 Greensboro Drive  
Suite 800  
McLean, VA 22102

National Emergency Number Association  
c/o James R. Hobson, Esq.  
Miller & Van Eaton, P.L.L.C.  
1155 Connecticut Avenue, NW  
Suite 1000  
Washington, DC 20036-4320

National Radio Astronomy Observatory  
c/o Christopher J. Reynolds, Esq.  
REYNOLDS and MANNING, P.A.  
PO Box 2809  
Prince Frederick, MD 20678

John R. Platt  
Executive Director  
New York State Thruway Authority  
200 Southern Boulevard  
Albany, NY 12209

Harland Reid  
Senior Director, Government Affairs  
Nissan Technical Center North America,  
Inc.  
Intelligent Transportation Systems  
Research  
196 Van Buren Street  
Suite 450  
Herndon, VA 20170-5345

Jerry Shelton  
North Texas Tollway Authority  
5900 West Plano Parkway  
Suite 100  
Plano, TX 75093

PanAmSat Corporation  
c/o Henry Goldberg, Esq.  
Joseph Godles, Esq.  
Brita Dagmar Strandberg, Esq.  
GOLDBERG, GODLES, WIENER &  
WRIGHT  
1229 19<sup>th</sup> Street, NW  
Washington, DC 20036

Ken Philmus  
Director  
Tunnels, Bridges & Terminals  
The Port Authority of NY and NJ  
One Madison Avenue  
7<sup>th</sup> Floor  
New York, NY 10010

Public Safety Wireless Network Executive  
Committee  
c/o Richard N. Allen  
Senior Associate  
Booz Allen Hamilton  
8283 Greensboro Drive  
McLean, VA 22102-3838

Siemens Transportation System  
c/o Phillip Inglis  
TRP Inc.  
14085 Howard Road  
Dayton, MD 21036

Donald J. Bergeron  
Vice President Manufacturing  
Sirit Technologies, Inc.  
1321 Valwood Parkway  
Suite 620  
Carrollton, TX 75006

Edmund J. Ring  
Intelligent Transportation Systems  
3M  
3M Center  
M/S 235-3F-08  
St. Paul, MN 55144

Richard N. Schnacke  
Vice President – Industry Relations  
TransCore Corporation  
3109 Fallow Circle  
Flower Mound, TX 75028

Kirk K. Van Tine  
General Counsel  
U.S. Department of Transportation  
400 7<sup>th</sup> Street, SW  
Washington, DC 20590

Dr. Ty A. Lasky  
Advanced Highway Maintenance and  
Construction Technology Research Center  
Department of Mechanical and  
Aeronautical Engineering  
University of California, Davis  
Davis, CA 95616-5294