

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Amendment of the Commission's Rules)	
Regarding Dedicated Short-Range Communication)	WT Docket No. 01-90
Services in the 5.850-5.925 GHz Band (5.9 GHz)	
Band) ¹)	
)	
Amendment of Parts 2 and 90 of the Commission's)	ET Docket No. 98-95
Rules to Allocate the 5.850-5.925 GHz Band to the)	RM-9096
Mobile Service for Dedicated Short Range)	
Communications of Intelligent Transportation)	
Services)	

NOTICE OF PROPOSED RULEMAKING AND ORDER

Adopted: November 7, 2002

Released: November 15, 2002

By the Commission:

Comment Due Date: 60 days after Federal Register publication]

Reply Comment Due Date: [90 days after Federal Register publication]

TABLE OF CONTENTS

Heading	Paragraph
I. INTRODUCTION AND EXECUTIVE SUMMARY	1
II. BACKGROUND.....	4
A. Creation of ITS	4
B. Development of ITS.....	5
C. Creation of ITS Radio Service and Allocation of the 5.9 GHz band to DSRC-based ITS Services.....	6
D. Table of allocations; Part 90 Intelligent Transportation Radio Service.....	9
E. ITS America Status Report and Responsive Public Comments.....	10
F. July <i>Ex Parte</i> Comments	11
III. DISCUSSION.....	12
A. The DSRC service.....	12
B. Eligibility	17
1. Public safety uses	18
2. Non-public safety uses	22

¹ The Commission opened WT Docket No. 01-90 under the following caption: "Intelligent Transportation System Applications Using Dedicated Short-Range Communications." See, e.g., *Order*, WT Docket No. 01-90, 15 FCC Rcd 5558 (2001). We are today revising the caption of this docket to more accurately reflect the scope of this proceeding.

C. Interoperability..... 24

D. Band Plan..... 35

E. Licensing Plan..... 40

 1. Road Side Units..... 41

 2. On Board Units..... 51

 3. Treatment of Incumbent Services..... 55

F. Grant of Licenses 59

G. Application, Licensing and Processing Rules..... 63

 1. Licensing 63

 2. Construction or Coverage/Service Requirements; License Term; Renewal Expectancy 64

 3. Universal Licensing System..... 67

H. Technical Rules..... 68

 1. Power limits and emission mask requirements 68

 2. Emissions Limits 70

 3. Antenna Height..... 72

 4. Frequency Stability Limits 73

I. Canadian and Mexican Coordination..... 74

J. Competitive Bidding Procedures 75

 1. Incorporation by Reference of the Part 1 Standardized Auction Rules..... 76

 2. Provisions for Designated Entities 77

K. Other Matters 82

IV. PROCEDURAL MATTERS..... 85

 A. Initial Regulatory Flexibility Analysis..... 85

 B. Paperwork Reduction Analysis..... 86

 C. *Ex Parte* Presentations 88

 D. Comment Dates..... 89

 E. Further Information..... 91

V. ORDERING CLAUSES..... 93

APPENDICES

Appendix A..... Initial Regulatory Flexibility Analysis

Appendix B..... List of DSRC-based ITS applications

Appendix C..... List of Commenters

I. INTRODUCTION AND EXECUTIVE SUMMARY

1. In this *Notice of Proposed Rulemaking and Order (Notice and Order)*, we propose service rules to govern the licensing and use of the 5.850-5.925 GHz band (5.9 GHz band) for Dedicated Short-Range Communications (DSRC) services in the Intelligent Transportation System (ITS) radio service.² Specifically in this *Notice and Order*:

- We propose to permit entities providing public safety DSRC operations to use the 5.9 GHz band.
 - For public safety entities, we propose to apply the application, licensing and processing rules under Part 90 of the Commission's Rules.
2. We generally seek comment on the following issues:
- whether to license Roadside Units (RSUs) by site or geographic area.
 - whether to permit non-public safety radio DSRC operations in the 5.9 GHz band:
 - In the event that we allow non-public safety radio applications in the 5.9 GHz band and in the event that the licensing scheme we select for those ITS applications results in mutually exclusive licenses, we propose to apply competitive bidding procedures under the Commission's Part 1 competitive bidding rules.
 - the definition of public safety in the context of ITS;
 - the definition of Dedicated Short-Range Communication Service (DSRCS);
 - the interoperability necessary for DSRC operations and how this interoperability should be achieved;
 - whether to license On Board Units (OBUs) associated with fixed systems under the associated RSU license.
 - whether the OBUs not associated with a fixed system should be licensed by rule or unlicensed under Part 15.
 - the appropriate licensing scheme or schemes for this band;
 - various channelization plans;
 - various technical matters; and
 - use of this band in Mexican and Canadian border areas.

² See 47 C.F.R. Part 90, Subpart M.

3. Dismissal of Petitions for Reconsideration. Further, we also seek comment on issues raised by two Petitions for Reconsideration or Clarification of the *Allocation Report and Order*.³ PanAmSat sought reconsideration of the Commission's decision that prior coordination between DSRC operations applications and Fixed Satellite Service (FSS) uplinks is unnecessary.⁴ Mark IV Industries sought reconsideration or clarification of the power levels and emission mask requirements established in the *Allocation Report and Order*.⁵ We dismiss these two petitions for reconsideration as moot because we are seeking comment on the issues raised through this *Notice*, and, with the benefit of a fuller record, will address those issues in this proceeding, *i.e.*, WT Docket 01-90.

II. BACKGROUND

A. Creation of ITS

4. The ITS⁶ program, a national program administered by the United States Department of Transportation (DOT), was created by Congress in the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA).⁷ The goals⁸ of the ITS program are challenging and ambitious; the ITS program incorporates technology and advanced electronics⁹ into the nation's surface transportation infrastructure to improve traveler safety, decrease traffic congestion, facilitate the reduction of air pollution, and conserve vital fossil fuels.¹⁰ To accomplish these goals, ISTEA required DOT to "promote *compatibility*

³ Amendment of Parts 2 and 90 of the Commission's Rules to Allocate the 5.850-5.925 GHz Band to the Mobile Service for Dedicated Short Range Communications of Intelligent Transportation Services, ET Docket No. 98-95, *Report and Order*, 14 FCC Rcd 18221 (1999) (*Allocation Report and Order*).

⁴ PanAmSat Corporation, Petition for Reconsideration or Clarification (filed Dec. 27, 1999) (PanAmSat Petition).

⁵ Mark IV Industries, Limited, I.V.H.S. Division, Petition for Clarification (filed Dec. 27, 1999) (Mark IV Petition).

⁶ Originally entitled "Intelligent Vehicle Highway Systems" ("IVHS"). See Intermodal Surface Transportation Efficiency Act of 1991, Pub. L. 102-240, 105 Stat. 1914 (1991) (ISTEA).

⁷ ISTEA at § 6051.

⁸ See ISTEA at § 6052(b).

⁹ Section 6059 of ISTEA defines ITS as:

The development or application of electronics, communications, or information processing (including advanced traffic management systems, commercial vehicle operations, advanced traveler information systems, commercial and advanced vehicle control systems, advanced public transportation systems, satellite vehicle tracking systems, and advanced vehicle communications systems) used singly or in combination to improve the efficiency and safety of surface transportation systems.

¹⁰ In 1998, DOT explained the ITS program as follows:

Surface transportation systems – the networks of highways, local streets, bus routes, and rail lines – are the ties that bind communities and facilitate commerce, connecting businesses and residents to work, homes, schools, services, and each other. During the past 20 years, however, transportation systems have struggled to keep pace with Americans' growing and changing travel needs. The General Accounting Office has projected that congestion in metropolitan areas could worsen by 300 to 400 percent over the next 15 years unless significant changes are made.

(continued...)

among intelligent [transportation] technologies throughout the States” [emphasis supplied].¹¹ In response to Congressional authorization to use an advisory committee,¹² DOT selected the Intelligent Transportation Society of America (ITS America)¹³ as its Federal Advisory Committee¹⁴ on ITS matters.

B. Development of ITS

5. After the passage of ISTEA, in 1991, DOT began to develop and deploy ITS.¹⁵ In doing so, DOT states that it worked with many public and private partners throughout the United States, including ITS America.¹⁶ In 1993, DOT, its partners, and ITS America started to develop a national architecture,¹⁷

(Continued from previous page) _____

Transportation in the aggregate, particularly when affected by these factors, poses an environmental threat as well. Finally, traffic accidents now claim more than 41,000 lives each year. Congress has decided to add new tools to the transportation system. Rather than continuing to rely simply upon quantitative additions to the existing transportation infrastructure, Congress has chosen to also emphasize the use of technology to improve the performance of that infrastructure.

United States Department of Transportation Comments to ET Docket No. 98-95 at 2 (DOT Comments).

¹¹ Section 6053(b) of ISTEA states:

The Secretary shall develop and implement standards and protocols to promote the widespread use and evaluation of intelligent vehicle-highway systems technology as a component of the Nation’s surface transportation systems. To the extent practicable, such standards and protocols shall promote compatibility among intelligent vehicle-highway systems technologies implemented throughout the States. In carrying out this subsection, the Secretary may use the services of such existing standards-setting organizations as the Secretary determines appropriate.

¹² ISTEA at § 6053(e).

¹³ ITS America, a Federal Advisory Committee to DOT, was first organized in 1991 and is a non-profit, educational association. Its members are drawn from the business, academic, and government sectors. ITS America has over 600 members. Over 350 of its members represent corporations involved in providing transportation of goods and services, 135 members represent federal, state, and municipal transportation agencies, and 50 members represent research institutions and universities. *See* Status Report on Licensing and Service Issues and Deployment Strategies for DSRC-Based Intelligent Transportation Services in the 5.850-5.925 GHz Band (filed by ITS America on Oct. 6, 2000) at 4-5 (Status Report). *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 from Mark D. Johnson, Squire, Sanders & Dempsey to Federal Communications Commission at 19 (filed July 9, 2002) (July *Ex Parte* Comments).

¹⁴ *See* Federal Advisory Committee Act, P.L. 92-463, 86 Stat. 770 (1972) *codified at* 5 U.S.C. Appendix 2.

¹⁵ DOT Comments at 2.

¹⁶ *Id.*

¹⁷ The Transportation Equity Act for the 21st Century (TEA-21) subsequently required the use of the National Architecture. Section 5206(a) of TEA-21 states:

Consistent with section 12(d) of the National Technology and Advancement Act of 1995 . . . , the Secretary shall develop, implement, and maintain a national architecture and supporting standards and protocols to promote the widespread use and evaluation of intelligent transportation system technology as a component of the surface transportation systems of the United States.

(continued...)

an organized approach to implementing ITS services.¹⁸ The National Architecture is designed to ensure the development of a seamless, multimodal, ITS system across the country; in essence, it is a master plan or a framework for the deployment of ITS technologies and systems for the next twenty years.¹⁹ Completed in 1996, and amended from time-to-time, the National Architecture²⁰ currently identifies thirty-two ITS User Services,²¹ which are divided into one or more of the eight User Service Bundles.²² Furthermore, the National Architecture identifies five communication linkages as necessary for one or more of these User Services: wide area broadcast, wide area two-way wireless, DSRC, vehicle-to-vehicle communication, and wireline communication.²³ The National Architecture identifies DSRC as critical for deploying many ITS User Services;²⁴ such uses are generally called DSRC-based ITS applications.²⁵ In (Continued from previous page) _____
Transportation Equity Act for the 21st Century, Pub. L. 105-178, 112 Stat. 107 at § 5206(a) (1998) (TEA-21).

¹⁸ U.S. Department of Transportation, *Intelligent Transportation Systems, The National Architecture for ITS: A Framework for Integrated Transportation into the 21st Century* (1996) at 2.

¹⁹ *Id.*

²⁰ The National Architecture establishes the types of information and communication that are needed to support various ITS services, how data should be shared and used by which physical entities, and the types of standards that are needed to facilitate sharing of information. ITS relies on the interaction among three “layers” of infrastructure, the transportation layer, the communications layer, and the institutional layer. The transportation layer is the physical ITS infrastructure composed of travelers, vehicles, and roadside equipment. The communications layer is the information infrastructure that connects elements of the transportation layer, thus allowing coordination and sharing among systems and people. The institutional layer is composed of organizations. *Id.* at 4.

²¹ ITS America states that as “expected use of the band increases in the future, new and unforeseen applications will be deployed consistent with the ITS User Service Bundles.” *See July Ex Parte Comments* at 24.

²² *July Ex Parte Comments* at 6, 24-25. The eight User Service Bundles are as follows: (1) Travel and Traffic Management, comprised of Probe Data Collection, and Traffic Information; (2) Maintenance Construction Operations, comprised of In-Vehicle Signing (Work Zone Warning, Highway/Rail Intersection Warning, and Road Condition Warning); (3) Public Transit Management, comprised of Transit Vehicle Data Transfer (gate and yard) and Transit Vehicle Signal Priority; (4) Electronic Payment, comprised of Toll Collection, Gas Payment, Drive-Thru Payment, Rental Car Processing, and Parking Lot Payment; (5) Commercial Vehicle Operations (CVO), comprised of Main Screening, Border Clearance, CVO Driver’s Daily Log; Unique CVO Fleet Management, and CVO Truck Stop Data Transfer; (6) Emergency Management, comprised of In-Vehicle Signing (Work Zone Warning, Highway/Rail Intersection Warning, and Road Condition Warning), On-Board Safety Data Transfer, Vehicle Safety Inspection, Emergency Vehicle Video Relay, and Emergency Vehicle Approach Warning; and (7) Advanced Vehicle Safety Systems, comprised of Intersection Collision Avoidance, In-Vehicle Signing (Work Zone Warning, Highway/Rail Intersection Warning, and Road Condition Warning), Vehicle-to-Vehicle (Vehicle Stopped or Slowing, Vehicle/Vehicle Collision Avoidance, and Imminent Collision Warning), Rollover Warning, and Low Bridge Warning; and (8) Information Management comprised of Main Screening, Border Clearance, Access Control Rental Car Processing, Unique CVO Fleet Management, CVO Truck Stop Data Transfer, Locomotive Fuel Monitoring, and Locomotive Data Transfer. *See also Appendix B* for a list of DSRC-based ITS applications in the 5.9 GHz band.

²³ United States Department of Transportation, *supra* note 18, at 6. ITS America states the at the 5.9 GHz band is not intended to support all ITS applications. *See July Ex Parte Comments* at 23.

²⁴ U.S. Department of Transportation, *Background: DSRC Allocation to Support Intelligent Transportation Systems* (Apr. 1997) at <http://www.its.dot.gov/tcomm/dsrcbk.htm>.

²⁵ *See Status Report* at 5-6.

this connection, ITS America states that DSRC is particularly useful for User Services that require “high-reliability real-time data communications with a rapidly moving vehicle.”²⁶

C. Creation of ITS Radio Service and Allocation of the 5.9 GHz band to DSRC-based ITS Services

6. In 1997, ITS America petitioned the Commission to allocate seventy-five megahertz of spectrum in the 5.9 GHz band for ITS, in particular for DSRC.²⁷ The petition noted that although DSRC-based ITS systems had been deployed in the Location and Monitoring Service in the 902-928 MHz band, that band “is simply too small and too congested” to support the many DSRC applications contemplated in the National Architecture.²⁸

7. In 1998, Congress passed and the President signed into law the Transportation Equity Act for the 21st Century (TEA-21).²⁹ TEA-21, the successor to ISTEA, reauthorized the national ITS program,³⁰ with two changes relevant here. First, TEA-21 directed the Commission, in consultation with DOT, to consider the spectrum needs “for the operation of intelligent transportation systems, including spectrum for the dedicated short-range vehicle-to-wayside wireless standard,”³¹ DSRC. TEA-21 directed the Commission to complete a rulemaking considering the allocation of this spectrum by January 1, 2000.³² Second, TEA-21 directed DOT to promote, through the National Architecture, *interoperability*³³ among

²⁶ *Id.* at 8.

²⁷ ITS America Petition for Rulemaking, RM 9096, ET Docket No. 98-95 at 1 (filed May 19, 1997) (ITS America Allocation Petition).

²⁸ *Id.* at ii.

²⁹ *See supra* n. 17.

³⁰ According to ITS America, from 1991-2003, Congress has authorized \$4 billion for the National ITS Program. July *Ex Parte* Comments at 4.

³¹ Section 5206(f) of TEA-21 states:

The Federal Communications Commission shall consider, in consultation with the Secretary, spectrum needs for the operation of intelligent transportation systems, including spectrum for the *dedicated short-range vehicle-to-wayside wireless standard*. Not later than January 1, 2000, the Federal Communications Commission shall have completed a rulemaking considering the allocation of spectrum for intelligent transportation systems.

(emphasis supplied).

³² *Id.*

³³ Section 5206(a) of TEA-21 states:

(2) Interoperability and efficiency.—To the maximum extent practicable, the national architecture shall promote interoperability among, and efficiency of, intelligent transportation system technologies implemented throughout the United States.

(3) Use of standards development organizations.—In carrying out this section, the Secretary may use the services of such standards development organizations as the Secretary determines to be appropriate.

ITS technologies implemented throughout the United States [emphasis supplied]. In addition, TEA-21 requires that all federal funds used to deploy ITS technologies conform to the National Architecture.³⁴

8. In October 1999, the Commission released the *Allocation Report and Order* allocating the 5.9 GHz band for DSRC-based ITS applications and adopting basic technical rules for DSRC operations. The Commission noted that the 5.9 GHz band was appropriate for DSRC operations “due to its potential compatibility with European and Asian DSRC developments.”³⁵ The Commission also amended³⁶ Subpart M of Part 90, the Intelligent Transportation Radio Service (ITS radio service)³⁷ to include the DSRC service in addition to the Location and Monitoring service.³⁸ Both the LMS service and the DSRC

³⁴ Section 5206(e)(1) of TEA-21 states:

Except as provided in paragraphs (2) and (3), the Secretary shall ensure that intelligent transportation system projects carried out using funds made available from the Highway Trust Fund, including funds made available under this subtitle to deploy intelligent transportation system technologies, conform to the national architecture, applicable standards or provisional standards, and protocols developed under subsection (a).

³⁵ *Allocation Report and Order*, 14 FCC Rcd at 18224 ¶ 7. The Commission further stated:

The European Road Transport and Traffic Telematics (“RTTT”) pre-standard consists of 10 megahertz at 5.795-5.805 GHz with an additional 10 megahertz available on a national basis at 5.805-5.815 GHz and recommends that this spectrum be made available on an exclusive basis to avoid interference. However, the European pre-standard allows for 5 megahertz channel pairs and is intended to provide far fewer applications than planned for in the National ITS Architecture for the U.S. Further, the European pre-standard states that future applications may require expansion of the available spectrum at 5.8 GHz. The Japanese pre-standard for DSRC applications plans to make 60 megahertz of spectrum available in the 5.8 GHz range on an exclusive basis. Further, the Japanese standard uses 10 megahertz channels in order to convey large amounts of data to fast moving vehicles as they pass through small communication areas.

Allocation Report and Order, 14 FCC Rcd 18221, 18225-18226 ¶ 10 (citations omitted).

Since the *Allocation Report and Order*, ITS America reports that Industry Canada is in the process of allocating the 5.855-5.925 GHz for DSRC operations, that additional spectrum in the 5.805-5.815 GHz band might be made available for DSRC operations in Europe, that Japan has made the 5.77-5.85 GHz band available for DSRC operations, and that Singapore and South Korea have made the 5.8 GHz Industrial, Scientific, and Medical (ISM) band available for DSRC operations. July *Ex Parte* Comments at 17.

³⁶ See *Allocation Report and Order*, 14 FCC Rcd 18221 at ¶ 1.

³⁷ The Transportation Infrastructure Radio Service was created in 1995. See Amendment of Part 90 of the Commission’s Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems, PR Docket No. 93-61, *Report and Order*, 10 FCC Rcd 4695, 4698 ¶ 6 (1995) (*LMS Report and Order*). In 1997 the Transportation Infrastructure Radio Service (TIRS) was renamed the Intelligent Transportation System radio service. See Amendment of Part 90 of the Commission Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems, PR Docket No. 93-61, *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking*, 12 FCC Rcd 13942, 13944 ¶ 2 (1997).

³⁸ The Location and Monitoring Service (LMS) operates in the 902-928 MHz band. It includes both multilateration and non-multilateration systems. Multilateration LMS systems “use spread spectrum technology to locate vehicles or other moving objects with great accuracy throughout a wide geographic area.” Non-multilateration LMS systems “use narrowband technology to transmit data to and from vehicles passing through a particular location.” *LMS Report and Order*, 10 FCC Rcd 4695, 4697 ¶ 4.

service seek “to develop and implement . . . intelligent transportation systems”³⁹ by integrating “radio-based technologies into the nation’s transportation infrastructure.”⁴⁰ The Commission deferred consideration of licensing and service rules and spectrum channelization plans to a later proceeding because the standards addressing those matters were still being developed by DOT.⁴¹ Specifically, the Commission invited “the ITS industry and the DOT to consider the spectrum requirements of various DSRC applications and recommend a spectrum channelization plan.”⁴² The Commission further found that “DSRC operations must comply with the RF safety guidelines contained in the *Second Memorandum Opinion and Order* . . . in ET Docket No. 93-62.”⁴³ A brief overview of the allocation of the 5.9 GHz band follows.

D. Table of allocations; Part 90 Intelligent Transportation Radio Service

9. Internationally, the 5.9 GHz band is allocated on a primary basis for Fixed Satellite Service (“FSS”) Earth-to-space links (“uplinks”) Fixed, and Mobile Services.⁴⁴ It is further designated internationally for industrial, scientific, and medical (ISM) applications.⁴⁵ In Region 2 it is also allocated on a secondary basis to the Amateur radio service and the Radiolocation service.⁴⁶ Domestically,⁴⁷ it is designated on a co-primary basis for DSRC operations,⁴⁸ the Government’s Radiolocation Service (*i.e.*, for use by high-powered military radar systems) and for non-Government Fixed Satellite Service (FSS) uplink operations. To ensure that mobile operations in 5.9 GHz band are ITS related, the Commission adopted footnote NG160 to the Table of Frequency Allocations to read as follows:

NG160 In the 5850-5925 MHz band, the use of the non-Federal government mobile service is limited to Dedicated Short-Range Communications operating in the Intelligent Transportation System radio service.⁴⁹

E. ITS America Status Report and Responsive Public Comments

10. On October 6, 2000, ITS America filed a “Status Report,”⁵⁰ on licensing and service rules and deployment strategies for DSRC, describing its consensus building activities, identifying issues, and

³⁹ 47 C.F.R. § 90.350.

⁴⁰ *Id.*

⁴¹ *Allocation Report and Order*, 14 FCC Rcd 18221 at ¶ 1.

⁴² *Id.* at 18231 ¶ 22.

⁴³ *Id.* at 18234 ¶ 27.

⁴⁴ *See* 47 C.F.R. § 2.106, Table of Frequency Allocations.

⁴⁵ *See id.*

⁴⁶ *See id.*

⁴⁷ *See id.*

⁴⁸ *See Allocation Report and Order*, 14 FCC Rcd 18221, 18227 ¶ 12.

⁴⁹ 47 C.F.R. § 2.106, Table of Frequency Allocations.

⁵⁰ *See* n. 13, *supra*.

setting forth the candidate technologies under consideration for DSRC-based ITS applications. The Wireless Telecommunications Bureau (Bureau) subsequently released a *Public Notice*⁵¹ seeking information from the public on the issues presented and discussed in the Status Report. Shortly thereafter, to assist in developing licensing and service rules for DSRC-based ITS applications, the Commission opened the captioned docket and placed the Status Report and related documents on the Electronic Comment and Filing System.⁵² Eight comments and four reply comments were received.⁵³

F. July *Ex Parte* Comments

11. On July 9, 2002, ITS America filed *Ex Parte* Comments⁵⁴ in which it proposed recommendations regarding the licensing and service rules. Those recommendations, discussed below, include a recommendation for the Commission to adopt a single wireless transmission standard,⁵⁵ 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-DSRC Standard), for all DSRC operations and equipment using the 5.9 GHz band.⁵⁶

III. DISCUSSION

A. The DSRC service

12. Background. As discussed above, the Commission designated the 5.9 GHz band for “Dedicated Short-Range Communications operating in the Intelligent Transportation Radio Service.”⁵⁷ The DSRC service is defined in Section 90.7 of the Commission’s Rules as:

[t]he use of non-voice radio techniques to transfer data over short distances between roadside and mobile radio units, between mobile units, and between mobile and portable units to perform operations related to the improvement of traffic flow, traffic safety, and other intelligent transportation service applications in a variety of public and commercial

⁵¹ Wireless Telecommunications Bureau Seeks Comment Regarding Intelligent Transportation System Applications Using Dedicated Short Range Communications, *Public Notice*, DA 01-686 (WTB PSPWD rel. Mar. 16, 2001) (corrected Mar. 22, 2001).

⁵² See Wireless Telecommunications Bureau Announces That Record Regarding “Status Report on Licensing and Service Issues and Deployment Strategies for DSRC-Based Intelligent Transportation Services in the 5.850-5.925 GHz Band” is Available on the Electronic Comment Filing Systems (ECFS), *Public Notice*, 16 FCC Rcd 8824 (PSPWD WTB 2001).

⁵³ See Appendix C.

⁵⁴ See *supra* n. 13.

⁵⁵ ITS America reports that a nationwide Canadian standard, the “Spectrum Management, Radio Standard, Location and Monitoring Service” is expected to be adopted and would include the same channelization plan specified in the ASTM-DSRC Standard. In Europe the Comité de Normalisation has developed a set of DSRC standards, including the Physical Layer (L1), Data Link Layer (L2) and Application Layer (L7). Japan has developed a national DSRC standard designated ARIB T-55 and a new generation designated ARIB T-75.” July *Ex Parte* Comments at 17-18.

⁵⁶ July *Ex Parte* Comments at ii.

⁵⁷ *Allocation Report and Order*, 14 FCC Rcd 18221, 18227 ¶ 12.

environments. DSRC systems may also transmit status and instructional messages related to the units involved.⁵⁸

13. The following is a brief description of DSRC-based ITS applications as submitted by ITS America. DSRC-based ITS applications vary by category (public safety or private radio), by range (less than fifty feet, 50-300 feet, 300-1100 feet, and 1000-3000 feet)⁵⁹ and by vehicle type (all vehicles, buses, trains, heavy trucks, and emergency vehicles).⁶⁰ DSRC operations will use short-range, low-power data transmissions of limited duration.⁶¹ DSRC operations involve the following two types of DSRC devices: a Roadside Unit (RSU) and an On-Board Unit (OBU).⁶² An RSU is a DSRC transceiver and is normally mounted along a road or a pedestrian passageway.⁶³ It may also, however, be mounted on a vehicle or be hand carried, but may only operate when stationary.⁶⁴ This portability will be for uses that are temporary, such as work zone warnings. An OBU is a DSRC transceiver that is mounted in or on a vehicle or it may be hand carried;⁶⁵ a portable OBU might be used at the scene of a car crash. An OBU can be operational while in motion or stationary.⁶⁶ According to ITS America, the majority of DSRC-based ITS wireless transmissions will occur either between vehicles or between a moving vehicle and a fixed transmitter in a line-of-sight, point-to-point, or point-to-multipoint configuration.⁶⁷ In many instances, ITS America states, the vehicle will be traveling at highway speeds and will quickly pass through the “communications zone” of a fixed transmitter.⁶⁸ ITS America states that it is estimated that the data rate must be at least six Mbs to ensure reliability.⁶⁹

14. Discussion. Since the *Allocation Report and Order* was released, we note that the number and kinds of DSRC-based ITS applications have changed and continue to evolve.⁷⁰ Therefore, we seek comment on whether the definition of “Dedicated Short-Range Communications Service,” originally adopted in the *Allocation Report and Order*, adequately covers the communication needs for all of the

⁵⁸ 47 C.F.R. § 90.7. *See also* 47 C.F.R. § 90.371.

⁵⁹ ITS America, Proposed North American 5.9 GHz Band Plan at 3 (filed Sept. 21, 2001) (First Proposed Band Plan).

⁶⁰ *Id.*

⁶¹ July *Ex Parte* Comments at 48.

⁶² ITS America, 5.9 GHz DSRC Band Plan and Rules Proposal at 10 (filed Jan. 23, 2002) (Second Proposed Band Plan).

⁶³ *Id.* at 11.

⁶⁴ *Id.*

⁶⁵ *Id.* at 13.

⁶⁶ *Id.*

⁶⁷ July *Ex Parte* Comments at 27.

⁶⁸ *Id.*

⁶⁹ *Id.* at 28.

⁷⁰ See Appendix B for a current list of ITS DSRC-based ITS applications.

DSRC-based ITS applications envisioned by the ITS community. For instance, we seek comment on whether transferring “data” would encompass the video and audio component of the “Emergency Vehicle Video Relay” application, a new application added by ITS America.⁷¹

15. In the July *Ex Parte* Comments, ITS America notes that it is expected that the OBU would be able to convert certain types of data transmissions into voice messages using a variety of methods, including Voice-over-IP, Voice XML, or another packet radio technique, which would “store and forward” the message.⁷² This technique would be used in the “Road Condition Warning” application in which a transportation agency would transmit, for example, a travel advisory warning drivers that they may encounter ice or other slippery conditions.⁷³ ITS America argues that this “store and forward” technique should not be construed as real-time, two-way communication, and thus, ITS America recommends that the word “non-voice” be deleted from the definition of DSRC.⁷⁴ In this connection, we note that real-time “voice” might be a component of some DSRC-based ITS applications, such as Emergency Vehicle Video Relay. Accordingly, we seek comment on ITS America’s recommendation.

16. Several commenters to the *Public Notice* commented on whether the DSRC service should include “intelligent transportation service applications in a variety of . . . commercial environments.”⁷⁵ One commenter states that “it is not unreasonable to assume that the market for . . . private and commercial uses will emerge more quickly and potentially could be larger than the requirements of public safety users.”⁷⁶ Others disagree, and maintain that the 5.9 GHz band will be fully loaded with public safety and private radio DSRC-based ITS applications.⁷⁷ In this connection, ITS America recommends that we replace the phrase “and commercial environments” with the phrase “and private environments.”⁷⁸ According to ITS America, this change permits both “private radio and commercial entities providing such services . . . to play an important role in the deployment of DSRC-based ITS applications.”⁷⁹ ITS America further maintains that such an amendment to the definition of DSRC service is necessary because “the DSRC spectrum is neither suitable for nor intended for cellular-based commercial applications such as CMRS [Commercial Mobile Radio Service⁸⁰].”⁸¹ In light of the concerns of ITS

⁷¹ *Id.*

⁷² July *Ex Parte* Comments at 26-27.

⁷³ *Id.* at 27.

⁷⁴ *Id.* at 27.

⁷⁵ *See supra* para. 12.

⁷⁶ Mark IV Industries Comments at 6.

⁷⁷ *See* TransCore Corporation Comments at 2. *See also* Federal Signal Corporation Comments at 2.

⁷⁸ ITS America Comments at 6.

⁷⁹ *Id.* at 5.

⁸⁰ According to the Commission’s Rules “Commercial Mobile Radio Service” is a mobile service that is:

(a)--

- (1) provided for profit, *i.e.*, with the intent of receiving compensation or monetary gain;
- (2) An interconnected service; and
- (3) Available to the public, or to such classes of eligible users as to be effectively available to a substantial portion of the public; or

(continued....)

America and because of the continuing development of DSRC-based ITS applications and to promote the flexible use of the band, we propose to amend the definition of DSRC service by deleting the phrase “of public and commercial” from Section 90.7 and 90.371(a) of the Rules;⁸² thus, these sections would read “a variety of environments.” We seek comment on the proposal. Commenters should note that this issue is directly related to the issue of eligibility, which is discussed below. While commercial uses are not specifically addressed below, we seek comment on whether commercial uses should be permitted in the 5.9 GHz band.

B. Eligibility

17. **Background.** ITS America recommends that the 5.9 GHz band “be designated for shared public safety and private services”⁸³ ITS America maintains that such shared use “will ensure that the band is put to its best and highest use for the greatest public benefit.”⁸⁴ In this connection, ITS America notes that permitting private radio services in the 5.9 GHz band is necessary to achieve national interoperability of DSRC services.⁸⁵ Nonetheless, ITS America reports that there is consensus that public safety will be dominant in the band and should be given priority over private transmissions.⁸⁶ Below, we discuss ITS America’s specific recommendation along with comments that we received on this issue.

1. Public safety uses

18. As mentioned above, we received several comments on who should be eligible to use the 5.9 GHz band. In assessing how the 5.9 GHz band should be used and by whom, we considered ISTE, TEA-21, as well as the Communications Act of 1934, ITS America’s First⁸⁷ and Second⁸⁸ Proposed Band Plans, the Status Report, the comments to the *Public Notice*, and the July *Ex Parte* Comments. Most importantly, however, we considered statutory language. The intent of Congress, as stated in Section 6059 of ISTE, is “to improve the efficiency and safety of surface transportation systems.”⁸⁹ TEA-21 reaffirmed this Congressional intent when it stated that one of the goals of the national ITS program was to enhance the safe operation of motor vehicles, particularly by reducing the number and severity of collisions.⁹⁰ In addition, we note that statistics compiled by DOT demonstrate the need for dramatic

(Continued from previous page) _____

(b) The functional equivalent of such a mobile service described in paragraph (a) of this section.

47 C.F.R. § 20.3.

⁸¹ ITS America Comments at 5. *See also* July *Ex Parte* Comments at 47.

⁸² 47 C.F.R. §§ 90.7 and 90.371(a).

⁸³ July *Ex Parte* Comments at 38 *citing Allocation Report and Order*, 14 FCC Rcd at 18236.

⁸⁴ *Id.* at 39.

⁸⁵ *See infra* para 22.

⁸⁶ July *Ex Parte* Comments at 38.

⁸⁷ *See supra* n. 59.

⁸⁸ *See supra* n. 62.

⁸⁹ ISTE at § 6059.

⁹⁰ TEA-21 at § 5203(a)(2).

improvement in the safety of the nation's surface transportation system. In 1999, there were 6,279,000 motor vehicle crashes in which 41,611 people were killed⁹¹ and 3,236,000 people were injured.⁹² Consequently, we disagree with PSWN's statement that the proposed use of the 5.9 GHz band "is only tangentially related to public safety . . . services"⁹³ and is "geared toward the development of technology for traffic management issues."⁹⁴ While we appreciate and champion the needs of traditional public safety entities,⁹⁵ in particular emergency responders such as police, fire departments, and medical personnel, the benefits of ITS service, such as preventing motor vehicle crashes, should not be diminished.⁹⁶ The prevention of injuries, fatalities, and property damage would benefit the public on both the societal and individual level. According to ITS America, many DSRC-based ITS applications promise to prevent these crashes from occurring.⁹⁷ Moreover, we note that Congress has also established improving the nation's ability to respond to emergencies and natural disasters as a goal of the national ITS program,⁹⁸ which should benefit traditional public safety entities. Finally, ITS America reports that the clear consensus of the ITS stakeholders is that "a significant portion of the DSRC spectrum be designated for ITS-related public safety services, and licensed as such."⁹⁹ Consequently, we tentatively conclude that the 5.9 GHz band should be used primarily for "public safety" purposes. We seek comment on this tentative conclusion.

19. *Public safety radio services.* In the July *Ex Parte* Comments, ITS America recommends that we define "public safety" for ITS purposes consistent with the definition of "public safety radio services" under Section 309(j)(2) of the Act.¹⁰⁰ Section 309(j)(2) exempts from the Commission's auction authority licenses and construction permits issued for "public safety radio services." "Public safety radio services"

⁹¹ According to the Federal Highway Administration, an agency of DOT, "motor vehicle crashes are the leading cause of death among Americans 1-34 years old" at http://safety.fhwa.dot.gov/facts_data_data.htm.

⁹² Bureau of Transportation Statistics, DOT, Table 2-17 Motor Vehicle Safety Data, <NTSS99main/http://www.bts.gov/btsprod/nts/Ch2_web/W2-17NEW>.

⁹³ PSWN Reply Comments at 3.

⁹⁴ *Id.*

⁹⁵ See The 4.9 GHz Band Transferred from Federal Government Use, Wt Docket No. 00-32, *Second Report and Order and Further Notice of Proposed Rulemaking*, FCC 02-47 (2002).

⁹⁶ We note that Commission precedent has a tradition of treating specific kinds of communications services related to transportation as public safety. The Highway Maintenance Radio Service, a part of the Public Safety Radio Services, was established in 1949 as an aid to other public safety services to keep main roads safe for vehicular traffic. State and local governmental entities are licensed in this service to provide emergency and routine communications for highway departments and maintenance vehicles and crews engaged in snow-plowing, clearing debris, repairing road damage, and otherwise maintaining highways to keep them open for normal travel. Wireless Telecommunications Bureau, Federal Communications Commission, Staff White Paper, Private Land Mobile Radio Services: Background (1996).

⁹⁷ See ITS America, [Delivering the Future of Transportation The National Intelligent Transportation Systems Program Plan: A Ten Year Vision](#) (2002), in which ITS America predicts that ITS will reduce the number and severity of accidents, thus saving 5,000-7,000 lives a year by 2011.

⁹⁸ TEA-21 at § 5203(a)(5).

⁹⁹ Status Report at 18.

¹⁰⁰ July *Ex Parte* Comments at 40.

include “private internal radio services used by State and local governments and non-government entities (NGOs) and including emergency road services provided by not-for-profit organizations, that—(i) are used to protect the safety of life, health, or property; and (ii) are not made commercially available to the public.”¹⁰¹ The public safety radio services exemption includes not only “traditional public safety services such as police, fire, and emergency medical services”¹⁰² but also non-commercial, private internal radio services used by State or local governmental entities, “without any further showing as to eligibility.”¹⁰³ Not-for-profit organizations that provide private internal, non-commercial radio service for emergency road services are specifically included.¹⁰⁴ Other non-commercial, private internal radio services may be classified as public safety radio services if they (1) are used by entities whose infrastructure is used primarily for the purpose of providing essential public services to the public at large; and (2) need, as part of their regular mission, reliable and available communications in order to prevent or respond to a disaster or crisis affecting the public at large.¹⁰⁵ Non-commercial, private internal radio services used by “utilities, railroads, metropolitan transit systems, pipelines, private ambulances, and volunteer fire departments”¹⁰⁶ have been found to meet this two-part test. A private internal radio service is “a service in which the licensee does not make a profit, and all messages are transmitted between fixed operating positions located on premises controlled by the licensee and the associated fixed or mobile stations or other transmitting or receiving devices of the licensee.”¹⁰⁷ One of the most common characteristics of private internal radio systems is that they are “not operated as a direct source of revenue, but rather as a means of internal communications to support the day-to-day needs of the licensees’ business operations.”¹⁰⁸ Service “not made commercially available to the public” means that the

¹⁰¹ 47 U.S.C. § 309(j)(2).

¹⁰² Implementation of Sections 309(j) and 337 of the Communications Act of 1934 as Amended, Promotion of Spectrum Efficient Technologies on Certain Part 90 Frequencies, Establishment of Public Service Radio Pool in the Private Mobile Frequencies Below 800 MHz, WT Docket No. 99-87, *Report and Order and Further Notice of Proposed Rulemaking*, 15 FCC Rcd 22709, 22740 ¶ 64 (*BBA Report and Order*). See also, Implementation of Sections 309(j) and 337 of the Communications Act of 1934 as Amended, WT Docket No. 99-87, *Memorandum Opinion and Order*, 17 FCC Rcd 7553, 7557 at ¶ 9 (2002) (*BBA MO&O*).

¹⁰³ *BBA Report and Order*, 15 FCC Rcd 22709, 22742-22743 ¶ 69. “We conclude that all state and local government entities are eligible for licensing in the public safety radio services without any further showing as to eligibility, subject to the statutory requirements for spectrum to be deemed auction-exempt.” *Id.*

¹⁰⁴ 47 U.S.C. § 309(j)(2). See *BBA Report and Order*, 15 FCC Rcd 22709, 22743 ¶ 71 in which the Commission discusses the legislative history of the Balanced Budget Act which indicates that this exemption applies to emergency road services provided by not-for-profit organizations, such as the American Automobile Association, but not to “internal road services used by automobile manufacturers and oil companies to support emergency road services provided by those parties as part of the competitive marketing of their products.”

¹⁰⁵ *BBA Report and Order*, 15 FCC Rcd 22709, 22747 ¶ 77.

¹⁰⁶ Though not specified in 47 U.S.C. § 309(j)(2), the Conference Report to the Balanced Budget Act of 1997, Pub. L. No. 105-33, Title III, 111 Stat. 251 (1997), identified these entities as public safety radio service eligibles. H.R. Conf. Rep. No. 105-217, 105th Cong., 1st Sess. at 572 (1997). See also, *BBA Report and Order*, 15 FCC Rcd 22709, 22746 ¶ 75 (2000).

¹⁰⁷ *BBA Report and Order* at 22741-22742 ¶ 67. See also *BBA MO&O*, 17 FCC Rcd at 7566 ¶ 32.

¹⁰⁸ Implementation of Sections 309(j) and 337 of the Communications Act of 1934 as amended, Promotion of Spectrum Efficient Technologies on Certain Part 90 Frequencies, Establishment of Public Service Radio Pool in Private Mobile Frequencies Below 800 MHz, WT Docket No. 99-87, *Notice of Proposed Rulemaking*, 14 FCC Rcd 5206, 5226 ¶ 33 (1999) (*BBA NPRM*). See also, Amendment of the Commission’s Rules Regarding Multiple Address Systems, WT Docket No. 97-81, *Memorandum Opinion and Order*, 16 FCC (continued....)

telecommunications “service is not provided with the intent of receiving compensation, and is not available to a substantial portion of the public.”¹⁰⁹

20. As described above, many DSRC-based ITS applications will be used to reduce the number of injuries and fatalities and the amount of property damage due to motor vehicle crashes. These purposes are consistent with Section 309(j)(2) of the Communications Act of 1934. Moreover, while many of these safety-related DSRC-based ITS applications will be used by State or local governmental entities, and NGOs authorized by governmental entities, it is also possible that a significant number of DSRC-based ITS applications will involve public safety operations by entities that are within the definition of public safety radio services, but either do not or should not, have to meet the criteria for NGO licensing under Section 337(f).¹¹⁰ Such entities are utilities, pipelines, railroads, metropolitan transit systems, private ambulances, or volunteer fire departments, which were specifically mentioned by Congress as eligible for the exemption under Section 309(j)(2).¹¹¹ These factors, in conjunction with the purpose of the Intelligent Transportation System program -- to improve the safety and efficiency of the nation’s surface transportation system through the use of advanced electronics and communications -- leads us to seek comment on whether we should define “public safety” for purposes of the ITS radio services consistent with the public safety radio services exemption in Section 309(j)(2) of the Act or in some other manner.

21. *Section 337(f)(1)*. We also seek comment on using the definition of public safety contained in Section 337(f)(1)¹¹² of the Act. Section 337(f)(1) of the Act defines “public safety services” as services:

- (A) the sole or principal purpose of which is to protect the safety of life, health, or property;
- (B) (i) by State or local government entities; or
(ii) by nongovernmental organizations that are authorized by a governmental entity whose primary mission is the provision of such services; and
- (C) that are not made commercially available to the public by the provider.¹¹³

Such a standard would generally limit uses of the spectrum to state and local governmental entities and non-governmental organizations authorized to provide public safety services by a governmental entity whose primary mission is to protect the safety of life, health, or property.¹¹⁴

(Continued from previous page) _____

Rcd 12181, 12187-12188 ¶ 12 (2001) (*MAS MO&O*) in which the Commission concluded that a company’s use of MAS frequencies constituted a private internal radio service, even though the remote units were installed at the end user’s premises. The Commission further found that because the service, monitoring alarm systems, was an “end-product, rather than a telecommunications service,” it was not a “direct source of revenue” but rather a “means of internal communications to support a business.”

¹⁰⁹ *BBA Report and Order*, 15 FCC Rcd 22709, 22750 ¶ 82. *See also BBA MO&O*, 17 FCC Rcd at 7566 ¶ 32 citing *MAS MO&O*, 16 FCC Rcd 12181, 12187-12188 ¶ 11.

¹¹⁰ *See infra* para. 21.

¹¹¹ *See supra* n. 106.

¹¹² 47 U.S.C. § 337(f)(1).

¹¹³ *Id.*

¹¹⁴ The Commission has previously concluded that all state or local government entities that provide of public safety services not made commercially available to the public fall within the definition of Section 337(f). *700 MHz First R&O*, 14 FCC Rcd at 180-81 ¶ 54; *see also* 47 C.F.R. § 90.523(a).

2. Non-public safety uses

22. In addition to public safety, ITS America recommends that private radio licensees providing DSRC-based ITS services be permitted in the band. ITS America believes that permitting private radio licensees in the 5.9 GHz band is necessary to achieve national interoperability of DSRC services;¹¹⁵ in essence ITS America maintains that permitting private radio licensees would create an incentive for vendors to quickly and economically develop the technology necessary for the numerous DSRC applications contemplated for this band.¹¹⁶ Incentives are needed because “making DSRC available in the 5.9 GHz band will require a very large technology investment by prospective vendors” who are “reluctant to make such an investment unless there is a clear market for the resulting products.”¹¹⁷ Public safety entities would then benefit from the cost savings derived from economies of scale,¹¹⁸ and “safety-related DSRC services should be accorded the highest priority in the licensing and service rules.”¹¹⁹ In light of ITS America’s consensus building activities and the favorable comments on this issue in response to the *Public Notice*, we seek comment on whether to allow “private,” *i.e.*, “non-public safety” DSRC operations in some portion of the 5.9 GHz band.

23. For commenters who believe that we should permit non-public safety uses of the 5.9 GHz band, we seek comment on ITS America’s recommendation to amend Part 90 of the Commission’s Rules to define “private services,” *i.e.*, “non-public safety use of the DSRC band,” as:

A radio service used for data transmission between a licensee’s fixed Roadside Unit located on premises controlled by the licensee and associated mobile On-Board Units of the licensee or non-associated mobile On-Board Units licensed by rule pursuant to this subpart, and is not offered as a telecommunications service or otherwise operated as a direct source of revenue, but is used to support the licensee’s business operations or to protect the safety of their employees, customers, or the general public.¹²⁰

We seek comment on whether we should permit non-public safety DSRC operations in the 5.9 GHz band; and, if so, whether we should adopt ITS America’s recommended definition of “private services,” *i.e.*, “non-public safety services.” We note that ITS America based its definition on 47 C.F.R. § 101.1305, which is the definition of “private internal services” that governs Multiple Address Systems (MAS).¹²¹ In this connection, we invite comment on whether to use that definition, which is as follows: “[a] private internal service is a service where entities utilize frequencies purely for internal business purposes or public safety communications and not on a for-hire or for-profit basis.”¹²² Alternatively, we seek comment on the feasibility of framing

¹¹⁵ Status Report at 22.

¹¹⁶ *See id.* at 9-10 and 19.

¹¹⁷ *Id.* at 9.

¹¹⁸ *Id.* at iii.

¹¹⁹ *Id.* at 18.

¹²⁰ July *Ex Parte* Comments at 47.

¹²¹ *See, e.g., id.* at 46 n.87 citing 47 C.F.R. § 1305.

¹²² 47 C.F.R. § 1305.

the definition of non-public safety use without reference to the definition of "private internal radio services." For example, should we instead enumerate specific DSRC-ITS applications that would qualify for non-public safety use? Or, could non-public safety use be defined as follows: "use of the 5.9 GHz band for DSRC, *see* 47 C.F.R. §§ 90.7, 90.371, that does not qualify as public safety use of the 5.9 GHz band"?

C. Interoperability

24. **Background.** Communications will form the backbone of DSRC-based ITS applications.¹²³ Interoperable DSRC-based ITS applications, in turn, will promote interstate commerce and enhance the safety and efficiency of the nation's surface transportation system. As noted above, several ITS applications are currently deployed in the 902-928 MHz band and have been successful.¹²⁴ ITS America reports that electronic toll collections have increased the capacity of toll collection systems by 250 percent with the resulting efficiency gains reducing emissions caused by idling motors by up to 83 percent.¹²⁵ Electronic clearance for commercial vehicles has been deployed along several trucking corridors, thus enabling regulatory authorities to quickly and accurately check credentials, size, weight, cargo, and selected safety information.¹²⁶

25. Although ITS America reports the successful implementation of DSRC operations in the 902-928 MHz band, it states that "the ITS community is confronting problems caused by non-interoperable systems and devices. . . ."¹²⁷ For example, ITS America explains, "[t]oll agencies . . . have required . . . vendors to create proprietary systems for individual toll systems;"¹²⁸ thus, even within a State, toll systems are often incompatible.¹²⁹ ITS America continues, "the lack of a common transmission standard" for electronic toll collection systems, such as Fastrak®, Tolltag®, Sunpass®, and EZ-Pass®, means that the tag for one toll system may cause interference to another toll system.¹³⁰ "Interstate vehicles, especially commercial vehicles are forced to carry multiple toll tags for commonly traveled routes or stop to pay at those toll booths for which it does not have a proprietary tag."¹³¹ ITS America concludes "[s]olving these and similar problems is not possible at the local or statewide level. National attention and resources must be applied."¹³² DOT also sought to address the lack of interoperable systems when it initiated a rulemaking to require the use of the "FHWA Specification for 'Dedicated Short Range

¹²³ ITS America Allocation Petition at 13.

¹²⁴ *See supra* para. 6.

¹²⁵ ITS America Allocation Petition at 13, *citing* U.S. Department of Transportation, "Intelligent Transportation Infrastructure Benefits: Expected and Experienced," Operation Time Saver Press Kit (January 1996).

¹²⁶ ITS America Allocation Petition at 15.

¹²⁷ July *Ex Parte* Comments at 30.

¹²⁸ *Id.*

¹²⁹ *See id.* at n.55, where ITS America states that "[o]nly California has attempted to require vendors to build toll equipment to a common standard."

¹³⁰ *Id.* at 30.

¹³¹ *Id.*

¹³² *Id.*

Commercial Communications (DSRC) for Commercial Vehicles” as a provisional standard for ITS commercial vehicle projects using highway trust funds.¹³³ Not only does a lack of interoperability negatively effect interstate commerce, it may become a disincentive to deploying several DSRC-based ITS applications especially those that are safety related, such as vehicle-to-vehicle communications, where it is critical that vehicles be able to communicate with each other regardless of their location.

26. *DOT*. Congress also recognized the need for national interoperable DSRC-based ITS applications. In enacting TEA-21 in 1998, Congress made several changes to the national ITS program that it had created in 1991, in ISTEA, and mandated that DOT and the Commission accomplish several tasks related to the development of national, interoperable DSRC operations. First, TEA-21 directed the Secretary of DOT, through the National Architecture, to promote “interoperability¹³⁴ among . . . intelligent transportation systems technologies implemented throughout the United States.”¹³⁵ Second, TEA-21 required DOT and ITS America to develop a National ITS Program Plan, in which DOT and ITS America were to “identify activities that provide for the dynamic development of standards and protocols to promote and ensure interoperability in the implementation of intelligent transportation system technologies. . . .”¹³⁶ Third, TEA-21 authorized DOT to “use the services of such standards development organizations as the Secretary determines to be appropriate.”¹³⁷ Fourth, TEA-21 required DOT to report to Congress, by June 1, 1999, “which standards are critical to ensuring national interoperability.”¹³⁸ In June 1999, DOT identified the standard for DSRC operations in the 5.9 GHz band as a critical standard.¹³⁹

27. *The Commission*. In response to TEA-21’s direction to the Commission to consider the spectrum needs for DSRC-based ITS systems,¹⁴⁰ the Commission released the *Allocation NPRM* which sought comment on “other technical issues in order to encourage industry to begin a process that, we believe, will lead to consensus on standards that will permit nationwide interoperability for some DSRC applications and that bear fruit in a future proceeding to establish licensing and service rules.”¹⁴¹ In the *Allocation Report and Order*, however, the Commission noted that the standards were still under

¹³³ See Dedicated Short Range Communications in Intelligent Transportation Systems (ITS) Commercial Vehicle Operations, FHWA Docket No. FHWA-99-584464, *Notice of Proposed Rulemaking*, Fed. Reg. 73674 (Dec. 30, 1999). Subsequently, FHWA reopened the comment period on Docket FHWA-99-5844 and delayed issuance of a final rule. See Dedicated Short Range Communications in Intelligent Transportation Systems (ITS) Commercial Vehicle Operations, FHWA Docket No. FHWA-99-584464, *Supplemental Notice of Proposed Rulemaking*, 65 Fed. Reg. 77534 (Dec. 12, 2000).

¹³⁴ ISTEA required the Secretary of DOT to promote compatibility among ITS systems. See *supra* n. 11.

¹³⁵ TEA-21 at 5206(a)(2).

¹³⁶ TEA-21 at § 5205(a)(2)(C).

¹³⁷ *Id.* at § 5206(a)(3).

¹³⁸ *Id.* at § 5206(b).

¹³⁹ U.S. Department of Transportation, *Intelligent Transportation Systems: Critical Standards* at 19 (June 1999).

¹⁴⁰ See *supra* n. 31.

¹⁴¹ Amendment of Parts 2 and 90 of the Commission’s Rules to Allocate the 5.850-5.925 GHz Band to the Mobile Service for Dedicated Short Range Communications of Intelligent Transportation Services, ET Docket No. 98-95, *Notice of Proposed Rulemaking*, 13 FCC Rcd 14321, 14335 ¶ 28. (1998) (*Allocation NPRM*).

development by DOT and once “such standards are developed, the Commission will take whatever action is necessary to implement the standards related to DSRC use.”¹⁴²

28. *ITS America and the Standards Writing Group.* Subsequent to the Commission’s allocation of the 5.9 GHz band to the mobile service for use by DSRC systems, ITS America began to hold stakeholder workshops, panel discussions, and other industry meetings to develop a consensus on how to achieve national interoperability in the deployment of DSRC-based ITS user services.¹⁴³ The Federal Highway Administration (FHWA), an agency of DOT entered into a cooperative agreement¹⁴⁴ with the American Society for Testing and Materials (ASTM)¹⁴⁵ to develop a national, interoperable standard for DSRC equipment operating in the 5.9 GHz band. ASTM, through its Working Group E17.51 (Standards Writing Group), which operates as a consensus-based organization in accordance with the operating principles of the American National Standards Institute (ANSI),¹⁴⁶ began to develop new user requirements for DSRC at 5.9 GHz and to draft open and interoperable standards.¹⁴⁷ Public safety agencies and others provided input to the Standards Writing Group.¹⁴⁸ Amtech Industries (now part of TransCore Corporation), Mark IV Industries, Raytheon, and Sirit Technologies, the primary DSRC manufacturers of North America, formed the DSRC Industry Consortium and provided input to the Standards Writing Group.¹⁴⁹ DOT funded Aeronautical Radio, Inc. (ARINC) and John Hopkins University’s Applied Physics Laboratory (JHU APL) to objectively analyze and evaluate competing technologies and standards for DOT and ITS America.¹⁵⁰

29. *The ASTM-DSRC Standard.* On August 24, 2001, the Standards Writing Group selected, by a vote of 20-2, a version of the Institute of Electrical and Electronic Engineers, Inc.’s (IEEE) 802.11 and 802.11a standard,¹⁵¹ which uses Orthogonal Frequency Division Multiplexing (OFDM),¹⁵² as the

¹⁴² *Allocation Report and Order*, 14 FCC Rcd at 18221 ¶ 1.

¹⁴³ Status Report at ii.

¹⁴⁴ See Transportation Equity Act for the 21st Century; Critical Intelligent Transportation Standards, Notice, 66 Fed. Reg. 20517 (Apr. 23, 2001), where the Federal Highway Administration (FHWA) states that, in response to the requirements of TEA-21, it entered into cooperative agreements with five Standards Development Organizations (SDOs), including ASTM, to accelerate the development of ITS standards that would promote national interoperability. FHWA further states that the standards developed under this program are “consensus standards and will remain the property of the SDO under which they were developed.” See also Status Report at 11-12.

¹⁴⁵ According to ITS America, ASTM is a participating member of the American National Standards Institute (ANSI). See July *Ex Parte* Comments at 13.

¹⁴⁶ ITS America reports that the proceedings of the Standards Writing Group are open, inclusive, and characterized by due process and that decisions are reached through consensus, cooperation, and compromise. July *Ex Parte* Comments at 13.

¹⁴⁷ Status Report at 11-12.

¹⁴⁸ *Id.* at 12.

¹⁴⁹ *Id.* at 15-16.

¹⁵⁰ *Id.* at 14-15.

¹⁵¹ ITS America maintains that using a variant of IEEE 802.11 and 802.11a “should provide the higher data rate capabilities and reliability needed for DSRC operations.” Moreover, ITS America maintains that a large (continued....)

preferred technology to provide national interoperability for DSRC operations.¹⁵³ The choice of OFDM¹⁵⁴ technology permits the use of a wide range of bandwidths, from tens of kHz to tens of MHz, thus giving licensees the flexibility to use the particular digital emissions and bandwidths that meet their operational needs.¹⁵⁵ Such flexibility would foster interoperability of equipment made by different manufacturers. On August 30, 2001, the OFDM Forum, an association organized to promote a single worldwide OFDM standard for high-speed wireless communications, endorsed the Standards Writing Group's selection of a variant of IEEE 802.11 and 802.11a, for roadside applications.¹⁵⁶ ITS America reported that the modification of IEEE 802.11 and 802.11a for ITS roadside applications was completed and successfully balloted by the ASTM Subcommittee E17.51 Vehicle Roadside Communication on May 10, 2002 and entitled "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-DSRC Standard).¹⁵⁷

30. ITS America recommends that the Commission specify that all DSRC operations in the 5.9 GHz band comply with the ASTM-DSRC Standard.¹⁵⁸ Specifically, ITS America recommends the adoption of layer 1, the Physical Layer and layer 2, the Medium Access Control Layer.¹⁵⁹ The Physical Layer, refers to the hardware specifications and modulations requirements and the Medium Access Control layer includes instructions detailing how the Physical Layer accesses the 5.9 GHz band frequencies.¹⁶⁰ ITS America reports that the ASTM-DSRC Standard is an open, non-proprietary wireless

(Continued from previous page) _____

manufacturing base exists for IEEE 802.11 and 802.11a, which could be used to manufacture DSRC equipment. July *Ex Parte* Comments at ii.

¹⁵² See Intelligent Transportation Society of America, *OFDM Technology Selected for Road Safety and Traffic Management Applications Standard* (Aug. 30, 2001) at <http://www.itsa.org/ITSNEWS.NSF>. See July *Ex Parte* Comments at 13.

¹⁵³ Intelligent Transportation Society of America, *IEEE 802.11a Selected For DSRC* (Aug. 27, 2001) at <http://www.itsa.org/ITSNEWS.NSF>.

¹⁵⁴ OFDM is a digital emission consisting of multiple carriers within a single authorized bandwidth or channel, each of which is modulated with a portion of the information being transmitted in the bandwidth or channel. The signal modulating each carrier is itself a digital emission, such as QAM (Quadrature amplitude modulation). The amplitudes and spacing of the carriers are such that the spectral energy of each carrier is significantly attenuated at the frequencies of each of the two adjacent carriers. See e.g., Request for Declaratory Ruling Removing the Commission's Minimum Carrier Tone Requirement for OFDM Modulation in the Multipoint Distribution and Instructional Television Fixed Services, MM Docket No. 01-145, *Declaratory Ruling and Order*, 16 FCC Rcd 17067 at n. 2 (2001).

¹⁵⁵ *Id.* at 17069 at ¶ 6.

¹⁵⁶ See *supra* n. 152.

¹⁵⁷ July *Ex Parte* Comments at 1-2, 13. ITS America states that the official publication by ASTM is expected in late summer 2002.

¹⁵⁸ *Id.* at 1.

¹⁵⁹ *Id.* at ii and iii.

¹⁶⁰ *Id.* ITS America reports that there are additional layers under development that do not implicate radio frequency issues.

standard and that a licensing fee will not be charged for its use, although ASTM holds the copyright to the ASTM-DSRC Standard.¹⁶¹ Consequently, ITS America recommends that the Commission incorporate the ASTM-DSRC Standard by reference into Part 90, Subpart M, of the Commission's Rules.¹⁶² ITS America further recommends that we amend Part 90 of the Commission's Rules and "invoke the certification procedures . . . found in subpart J of Part 2 of the Commission's Rules"¹⁶³ to require DSRC equipment manufacturers to comply with the ASTM-DSRC Standard¹⁶⁴

31. Discussion. As noted above, the statutory framework of the ITS program demonstrates that Congress believes that intelligent transportation technologies should be interoperable and TEA-21 appears to contemplate the adoption of a "wireless"¹⁶⁵ standard as a means towards achieving interoperability.¹⁶⁶ Neither ISTEA nor TEA-21 defines interoperability within the context of the ITS program. In this connection, we note ITS America's comment that both public safety and non-public safety radio must use the same standard to achieve economies of scale, and their recommendation that we specify that all DSRC operations and equipment using the band conform to the ASTM-DSRC Standard. We seek comment on whether all applications in the band must be interoperable or whether only the public safety applications must be interoperable. Because our current definition of "interoperability"¹⁶⁷ does not contemplate public safety and non-public safety radio licensees sharing an interoperable standard, we seek comment on whether we should revise it to exclude DSRC. Alternatively, should we adopt a separate definition of "interoperability" for DSRC operations? For example, the current Part 90 definition of interoperability concerns only the communications link; we seek comment on whether any definition of interoperability in the context of DSRC, should include equipment compatibility, such that OBUs and RSUs coming from different vendors should be interchangeable¹⁶⁸ Thus, an OBU or RSU manufactured by vendor X would be able to communicate and exchange information with an OBU or RSU manufactured by vendor Y.

32. While ITS America has developed a consensus on the adoption of the ASTM-DSRC Standard as the means of achieving interoperability, as a general rule, the Commission does not select a single standard for equipment,¹⁶⁹ leaving the selection of technology to its licensees. ITS America notes, however, that the Commission has, in the past, adopted standards when there is a substantial public

¹⁶¹ *Id.* at 29, 35, and n. 33. *See also* n. 144 *supra*.

¹⁶² *Id.* at 37.

¹⁶³ *Id.* at 38.

¹⁶⁴ *Id.* 37-38

¹⁶⁵ *See supra* n. 31.

¹⁶⁶ TEA-21 states that "the Secretary shall develop . . . a national architecture and supporting standards" and "[i]n carrying out this section, the Secretary may use the services of such standards development organizations the Secretary determines to be appropriate." TEA-21 at § 5206(a)(1) and (3).

¹⁶⁷ Section 90.7 of the Commission's Rules defines interoperability as "An essential communication link within public safety and public service wireless communications systems which permits units from two or more different entities to interact with one another and to exchange information according to a prescribed method in order to achieve predictable results." 47 C.F.R. § 90.7.

¹⁶⁸ *See para. 40 infra* for a detailed discussion of OBUs and RSUs.

¹⁶⁹ *See, e.g., 700 MHz First R&O*, 14 FCC Rcd at 207-211 ¶¶ 118, 121, 123, 124, 130, 132.

benefit and when private industry is unwilling or unable to reach agreement on a single industry standard.¹⁷⁰ Moreover, ITS America states that “[w]here products and services, whether for communications or otherwise, are introduced to the public based on competing standards, it has taken years or even decades to gain market acceptance.”¹⁷¹ ITS America further maintains that requiring DSRC equipment to be type-certified would create an incentive for equipment manufacturers to develop equipment specifications based on the ASTM-DSRC Standard because they would have access to the largest possible market.¹⁷² ITS America further argues that the adoption of a particular standard would assure customers that an investment in a particular technology would not be “rendered obsolete by a subsequent, different technology.”¹⁷³ ITS America further maintains that the “lack of standards may cause consumers and manufacturers to adopt a ‘wait and see’ approach before purchasing or making devices, respectively slowing down deployment.”¹⁷⁴

33. In light of the efforts of ITS America, ASTM, and DOT to reach a consensus on the adoption of the ASTM-DSRC Standard for the development and deployment of DSRC operations, we seek comment on whether the industry as a whole has reached an agreement on the adoption of the ASTM-DSRC Standard, thus rendering our incorporation of a particular standard into the Commission’s Rules unnecessary. We seek comment on whether we should adopt a standard applicable to public safety and non-public safety radio DSRC operations or whether we should adopt a standard only for public safety DSRC operations. We seek comment on whether the marketplace can achieve the interoperability necessary for DSRC-based ITS systems. If the marketplace cannot achieve interoperability, are there other ways of achieving interoperability without compromising competitive neutrality? We seek comment on whether we should require DSRC devices to be type-certified under the Commission Rules. We further seek comment on whether the complex technology involved in DSRC operations, which may change rapidly, would render a particular standard obsolete or whether the adoption of a particular standard would spur development of the DSRC radio service.

34. If commenters believe that the adoption of a standard is necessary, we ask these commenters whether the ASTM-DSRC Standard is the appropriate standard. For standards that consist of numerous layers and/or suites or menus, commenters should specify whether the Commission should adopt any specific layers, suites or items within menus within that standard relative to the communications link. We seek comment on ITS America’s recommendation that we adopt Layers 1 and 2 of the ASTM-DSRC standard for all DSRC operations in the 5.9 GHz band. The full standard is available at www.ASTM.org. We further seek comment on whether we should adopt equipment performance requirements for this band. We note that it is vital that the performance requirements capture the ideal compromise between component size, power consumption, and radiated power needed to implement DSRC operations. We note that for the Commission to adopt a particular standard, we require that such a standard be approved in an open and fair process, and that it be approved by an ANSI-Accredited Standards Developer. We further require that the owner or holder of the rights to the standard agree, by filing a statement with ITS America or DOT, that they will make such rights available without cost or without discrimination.¹⁷⁵ We

¹⁷⁰ July *Ex Parte* Comments at 32.

¹⁷¹ *Id.* at 29.

¹⁷² *Id.* at 37-38.

¹⁷³ *Id.* at 32.

¹⁷⁴ *Id.* at 33.

¹⁷⁵ For similar requirements placed on the National Coordination Committee, in developing an interoperable standard in the 700 MHz public safety band, *see* Development of Operational, Technical and (continued....)

note that, should we decide that the adoption of a particular standard is necessary, we will not unnecessarily disturb future recommendations by the ANSI-Accredited Standards Developer.

D. Band Plan

35. In the *Allocation NPRM*, the Commission recognized that “some channelization of the DSRC spectrum may be essential to promote spectrum efficiency and to facilitate interoperability.”¹⁷⁶ In this regard, ITS America recommends that the Commission adopt a channel plan, described below, to further promote interoperability between DSRC-based ITS applications in this country.¹⁷⁷ ITS America further indicates that it has initiated talks with Canada and Mexico to achieve agreement on channel plans at the borders.¹⁷⁸ See the diagram below for a brief overview of the ASTM-DSRC Standard channelization plan.

5.850 GHz		CH175			CH181		5.925 GHz
reserve	CH172	CH174	CH176	CH178	CH180	CH182	CH184
	service (vehicle-to-vehicle)	service	service	control	service	service	service (high power)
5 MHz	10 MHz	10 MHz	10 MHz	10 MHz	10 MHz	10 MHz	10 MHz

36. Accordingly, we seek comment on the ITS America’s recommended channelization plan,¹⁷⁹ contained in the ASTM-DSRC Standard, which is an adaptation for DSRC of the IEEE 802.11a standard. ITS America concluded that the use of ASTM-DSRC Standard would promote interoperability, and would allow data exchange rates of up to 27 Mbps or up to 54 Mbps, depending on whether ten-megahertz-wide or twenty-megahertz-wide channels are used.¹⁸⁰ These data rates and channel bandwidths are the consequence of choosing Orthogonal Frequency Division Multiplexing as the modulation scheme. ITS America’s channel plan, as depicted above, divides the seventy-five megahertz of spectrum into eight channels: one five-megahertz channel and seven¹⁸¹ ten-megahertz channels, which include one

(Continued from previous page) _____

Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements through the Year 2010, WT Docket No. 96-86, *Memorandum Opinion and Order on Reconsideration*, 14 FCC Rcd 8059 (1999). We note that ASTM holds the copyright to the ASTM-DSRC Standard. See July *Ex Parte* Comments at n. 33.

¹⁷⁶ *Allocation NPRM*, 13 FCC Rcd 14321, 14340 ¶ 38.

¹⁷⁷ See First and Second Proposed Band Plans. See also July *Ex Parte* Comments at 58-64.

¹⁷⁸ See Second Proposed Band Plan at 5, 10, and 16.

¹⁷⁹ See Second Proposed Band Plan. See also July *Ex Parte* Comments at 58-64 and Appendix D.

¹⁸⁰ July *Ex Parte* Comments at 58-62.

¹⁸¹ ITS America reports that to complete a successful transmission in highly reflective urban multi-path locations, the Standards Writing Group modified IEEE 802.11a by reducing the clock frequency, data rates, and channel bandwidths by a factor of two to provide more robust and reliable communications. According to ITS America this calculation results in channel bandwidths of 10 megahertz with possible data rates from six Mbit/s to 27 Mbit/s. July *Ex Parte* Comments at 58-59.

Control Channel and six Service Channels. The five-megahertz channel is reserved for harmonization with potential extension of the Unlicensed National Information Infrastructure (UNII) band. Two service channels¹⁸² are dedicated; Channel 172 for public safety and private vehicle-to-vehicle communications, and Channel 184 for public safety “high power, long-range” communications of up to 1000 meters and private uses when authorized by a frequency coordinator.¹⁸³ Private applications, however, must not interfere with, and must accept interference from, existing Public Safety applications when transmitting on Channel 184.¹⁸⁴ Four ten-megahertz Service Channels, Channels 174/176 and Channels 180/182 can be combined to provide up to two, twenty-megahertz Service Channels, Channels 175 and 181, respectively, thus increasing the possible maximum data rate to 54 Mbps.¹⁸⁵

37. Channel 178 is dedicated for Control Channel functions.¹⁸⁶ ITS America reports that the ASTM-DSRC Standard does not yet include a layer addressing how the Control Channel will be accessed.¹⁸⁷ According to ITS America, however, to maximize the efficiency and quality of service in the 5.9 GHz band while minimizing interference between services, the Control Channel should be used for communications shorter than 200 microseconds,¹⁸⁸ in intervals of no less than two seconds. Possible protocol for the Control Channel access could include the requirement that all OBUs automatically select and monitor the Control Channel, and wait for announcements, data transfers, or warning messages from RSUs.¹⁸⁹ Public safety and private radio licensees would share use of the Control Channel to ensure that public safety warning announcements are received by all OBUs within the particular public safety communications zone.¹⁹⁰ Private messages shorter than 200 microseconds could be transmitted on the Control Channel,¹⁹¹ although public safety messages would always receive higher priority for use of the Control Channel.¹⁹²

¹⁸² ITS America reports that the ASTM-DSRC Standard derives its numbering scheme from the IEEE 802.11a variant and the UNII band at 5735-5815 MHz to prevent channel selection discrepancies in dual mode devices. July *Ex Parte* Comments at 59.

¹⁸³ Second Proposed Band Plan at 9, 16. July *Ex Parte* Comments at 60 and 62.

¹⁸⁴ Second Proposed Band Plan at 15.

¹⁸⁵ Second Proposed Band Plan at 16. July *Ex Parte* Comments at 62. *See also* Section III.B hereof for discussion of eligibility. ITS America reports that using an OFDM modulation system, the control channel and service channels can support data transmission rates of 3, 4.5, 6, 9, 12, 18, 24, and 27 Mbit/s. Optional twenty-megahertz channels can achieve transmission rates of 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s. July *Ex Parte* Comments at 59.

¹⁸⁶ July *Ex Parte* Comments at 60.

¹⁸⁷ *Id.* at 60-61, and Appendix C at 12. ITS America reports that protocols for using the Control Channel are expected to be finalized and available for Commission consideration as part of any future rulemaking proceeding. ITS America states that the ASTM-DSRC Standard is “prepared with the assumption that there will be additional higher layer aspects to the standard, including Control Channel access.” *Id.* at 60.

¹⁸⁸ *Id.* at 60

¹⁸⁹ Second Proposed Band Plan at 10. July *Ex Parte* Comments at 60.

¹⁹⁰ July *Ex Parte* Comments at 61 and 63.

¹⁹¹ *Id.* at 61.

¹⁹² Second Proposed Band Plan at 8. July *Ex Parte* Comments at 61.

38. We also seek comment on alternatives to the ITS America band plan. For example, would it be better to establish a different channel band-width, such as five-megahertz per channel? In addition, we solicit comment on whether the band should be shared by all eligibles or whether it would be more appropriate to allocate the band by service. For example, we could divide the spectrum up by radio service instead of by function. Commenters supporting this approach should specify the different groups and how much spectrum should be allocated to each group. Because it appears that a very low power transmitter will be needed in vehicles (cars, trucks, vans, *etc.*) participating in ITS, another possible option would be to divide the spectrum based on licensed and unlicensed (Part 15) services. We further request comment on whether we should reserve spectrum. As mentioned above, ITS America proposes that we reserve five-megahertz of spectrum. In light of the fact that the number and type of DSRC-based ITS applications continue to evolve, is five-megahertz sufficient? Should we reserve more? In the 700 MHz proceeding, we reserved thirty-seven percent of the spectrum.¹⁹³ We seek comment on whether we should reserve a ten-megahertz segment from both channels 175 and 181.

39. As noted, seventy-five megahertz of contiguous spectrum in the 5.9 GHz band has been allocated for DSRC operations. In the event that we select a licensing plan that results in the possibility of mutually exclusive applications for initial licenses, we seek comment on the appropriate amount of spectrum to be provided to each licensee. We seek comment on whether the spectrum should be licensed as one block, or broken down into two or more bandwidths, and whether there should be a mixture of spectrum blocks, depending on the service areas used for licensing. Commenters should note that this issue is directly linked to the outcome of the interoperability issue because it appears that the interoperability standard may channelize the band. The merits of sharing a particular channel, versus having exclusive use of it should be considered in light of some of the suggested non-public safety applications, such as Vehicle Diagnostic Data Transfer, or Locomotive Data Transfer. Regarding the RSUs, the merits of using the lowest possible transmit power for a particular application, which would improve the possibility of more licensees in a given area, should also be considered.

E. Licensing Plan

40. Background. We seek comment on the appropriate licensing plan for ITS. In order to discuss the licensing plan, some background concerning how DSRC-based ITS applications will communicate, according to ITS America, is necessary. As noted above, RSUs and OBUs will communicate using short-range, low-power data transmissions of limited duration.¹⁹⁴ Specifically, an RSU broadcasts data to or exchanges data with an OBU in its “communication zone” and provides channel assignments and operating instructions to it.¹⁹⁵ OBUs receive, contend for time to transmit, or are assigned a time to transmit on one or more radio frequency channels.¹⁹⁶ Except where specifically excluded, OBU operation is permitted wherever vehicle operation or human passage is permitted.¹⁹⁷

¹⁹³ See The Development of Operational, Technical and Spectrum Requirements For Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010 Establishment of Rule Requirements for Priority Access Service, WT Docket No. 96-98, *First Report and Order and Third Notice of Proposed Rulemaking*, 14 FCC Rcd 152, 157 ¶ 8.

¹⁹⁴ See *supra* para. 13 for additional background on DSRC devices.

¹⁹⁵ Second Proposed Band Plan at 11.

¹⁹⁶ *Id.* at 13.

¹⁹⁷ *Id.*

OBU may communicate with RSUs or other OBUs.¹⁹⁸ Except for designated applications, it is expected that all OBUs will automatically select the Control Channel and wait for application announcements, data transfers, or warning messages.¹⁹⁹ An application announcement will identify a DSRC service channel to be used for data transfer larger than those which can be handled by the Control Channel.²⁰⁰ For public safety applications at intersections, such as “emergency vehicle signal pre-emption” and “transit vehicle signal priority,” a second OBU for intersection applications will be mounted in the public safety vehicle.²⁰¹ The intersection application OBU does not use the Control Channel.²⁰² For vehicle-to-vehicle applications, communications will be limited to only public safety related messages, such as vehicle location, status, and acceleration. The vehicle-to-vehicle OBU will be a second OBU in the vehicle and it does not use the Control Channel.²⁰³ RSUs and OBUs must “listen” before transmitting.²⁰⁴

1. Road Side Units

41. Discussion. ITS America recommends that we propose to license the fixed RSU²⁰⁵ on a shared, site-specific basis. Under site-specific licensing, a licensee is authorized to operate a station only at a specific location, using a specific frequency or frequencies. Generally, licenses are awarded on a first-come, first served basis, and/or after frequency coordination, which is the process by which a private organization, in most instances a FCC-certified frequency coordinator, recommends to the Commission the most appropriate frequencies for a station.²⁰⁶ The application, filed through the Universal Licensing System,²⁰⁷ proposes a transmission frequency, geographical coordinates, and other technical information concerning the proposed station, including its potential for electromagnetic interference with adjacent stations.

42. ITS America proposes that each licensed RSU would also correspond to, or be associated with, a specific “communications zone,” within which all transmissions associated with it would be required to take place.²⁰⁸ Under ITS America’s recommendation, the licensed communications zone for

¹⁹⁸ *Id.*

¹⁹⁹ *Id.* See also July *Ex Parte* Comments at 61.

²⁰⁰ Second Proposed Band Plan at 13.

²⁰¹ First Proposed Band Plan at 7.

²⁰² *Id.* at 7.

²⁰³ *Id.* at 8.

²⁰⁴ Second Proposed Band Plan at 14.

²⁰⁵ ITS America recommends that the fixed RSU be licensed on a site specific basis, but it does not describe how the portable/mobile RSU should be licensed. July *Ex Parte* Comments at 48.

²⁰⁶ See 47 C.F.R. § 90.175.

²⁰⁷ Biennial Regulatory Review – Amendment of Parts 0, 1, 2, 13, 22, 24, 26, 27, 80, 87, 90, 95, 97, and 101 of the Commission’s Rules to Facilitate the Development and Use of the Universal Licensing System in the Wireless Telecommunications Services, WT Docket No. 98-20, Amendment of the Amateur Service Rules to Authorize Visiting Foreign Amateur Operators to Operate Stations in the United States, WT Docket No. 96-188, *Report and Order*, 13 FCC Rcd 21027 (1998) (*ULS Report and Order*).

²⁰⁸ July *Ex Parte* Comments at 49.

public safety and non-public safety radio licensees would be permitted to overlap; public safety warning messages would be given priority rights for transmission across shared channels and overlapping communication zones, as well as generally in the band.²⁰⁹ Directional antennas would be recommended to guard against harmful interference to adjacent communication zones and public safety communication zones that may overlap.²¹⁰ A communications zone for a particular RSU would be based on “the type of entity seeking a license, the type of proposed DSRC application, the requisite range for that application, the class of DSRC device, the transmitter power needed for that range for that application,”²¹¹ how and where the RSU is to be installed, the type of antenna (directional or omnidirectional), the angle of antenna relative to the horizon or horizontal adjacent physical structures, and the topography.²¹² For example, an emergency vehicle preemptive traffic light application would use a license that allows a 44.8 dBm maximum EIRP, and a directional antenna. A vehicle-to-vehicle application on the other hand might permit the use of an omnidirectional antenna, and maximum 10 dBm EIRP.

43. The ASTM-DSRC Standard contains the following four DSRC device classes to be used for equipment-type certification for RSUs and OBUs, based on maximum device output power.²¹³

<u>Device Class</u>	<u>Maximum Device Output Power</u>
A	0 dBm
B	10 dBm
C	20 dBm
D	28.8 dBm

Next the ASTM-DSRC Standard limits operating fixed and portable RSUs in accordance with one of four installation classes, which would limit the maximum range of transmission (measured in meters) and the maximum transmitted power (measured in effective isotropic radiated power (EIRP)) that can be radiated in a particular direction.²¹⁴ The four installation classes are:

<u>Class</u>	<u>Maximum EIRP</u>	<u>Maximum Transmission Range</u>
Class 1	10 dBm EIRP	Up to 15 meters
Class 2	20 dBm EIRP	Up to 100 meters
Class 3	33 dBm EIRP	Up to 400 meters
Class 4	44.8 dBm EIRP	Up to 1000 meters

According to ITS America, these equipment and license “class designations are intended to simplify the application process and create a consistent licensing scheme for prospective licensees and frequency coordinators.”²¹⁵ By using these two types of class designations, and setting both output power and EIRP

²⁰⁹ *Id.*

²¹⁰ *Id.* at 53.

²¹¹ *Id.*

²¹² *Id.*, Appendix C at 8.

²¹³ *Id.* at 49.

²¹⁴ *Id.* at 50.

²¹⁵ *Id.* at 50-51.

values, the possibility of increasing the numbers of users per given area increases, since more direct control over range of transmission is exerted. For administrative ease, ITS America recommends that applicants may seek authority to use up to six RSUs per license with the latitude and longitude and class designations identified for each.²¹⁶

44. According to ITS America, this scheme would work as follows. An RSU at a toll plaza would, in most instances, require a communications zone covering a single lane of traffic. In this instance, an installation Class 1 or Class 2 designation using Class A or B devices would be appropriate.²¹⁷ An RSU at a major highway intersection that transmits messages or traffic conditions would use an installation Class 3 or Class 4 designation and a Class C or D device.²¹⁸

45. ITS America further recommends that FCC-certified frequency coordinators for existing public safety and private radio bands be authorized to coordinate applications for licenses in the DSRC radio service in the 5.9 GHz band; FCC-certified coordinators for the Public Safety pool would coordinate applications for public safety DSRC operations, and FCC-certified coordinators for the Industrial/Business pool would coordinate applications for private radio DSRC operations.²¹⁹ The frequency coordinator would verify that an applicant would not implement an unnecessarily large communications zone or produce an excessive interference contour in relation to the proposed DSRC-based ITS application.²²⁰ Frequency coordinators would also attempt to minimize potential interference by assigning different Service Channels to licensees in overlapping or adjacent communications zones and/or requiring the use of directional antennas.²²¹ Frequency coordinators would review and specify the maximum authorized transmitter output power and range, and the RSU's class designation and would specify the Service Channels on which the licensee would be authorized to operate.²²²

46. We see, however, several potential disadvantages to site-specific licensing. We note that site specific licensing may be very cumbersome for radio systems comprised of several hundred sites. We further note that site-based licensing deprives licensees of the flexibility to relocate transmitter sites within a defined service area without obtaining the Commission's prior approval. Moreover, Section 8 of the Act²²³ requires an application fee for each application, and Section 9 of the Act²²⁴ requires a regulatory fee for each license, although in some instances governmental entities and non-profit organizations are exempt from fees.²²⁵ Applicants would also have to pay for the services of a frequency

²¹⁶ *Id.* at 52-53.

²¹⁷ *Id.* at 51.

²¹⁸ *Id.*

²¹⁹ *Id.* at 64.

²²⁰ *Id.* at 65.

²²¹ *Id.*

²²² *Id.*

²²³ 47 U.S.C. § 158.

²²⁴ 47 U.S.C. § 159.

²²⁵ *See* U.S.C. §§ 158(d)(1) and 159(h).

coordinator every time they wanted to activate a new RSU or relocate an existing RSU. We note that all licensees would be required to be licensed for the control channel in addition to specific service channels.

47. In contrast, there are several potential advantages to geographic area licensing for RSUs. Under geographic area licensing, the licensee is authorized to operate within its geographic service area. Such licensees may operate without filing an application for individual stations within their service areas; thus, a licensee may modify, move, or add to its facilities within specified geographic areas without need for prior Commission approval.²²⁶ This not only increases a licensee's flexibility to manage its spectrum, it also reduces administrative burdens and operating costs.²²⁷ Geographic area licensing also facilitates interoperability and operational standards while allowing economies of scale that encourage the development of low cost equipment.²²⁸ Moreover, the Commission has found that geographic area licensing offers distinct advantages for both public safety and commercial services.²²⁹ With regard to the RSUs used for private radio DSRC-based ITS applications, we have stated that we will determine on a service-by-service basis, whether to adopt a geographic licensing scheme or retain eligibility and use rules.²³⁰ Accordingly, we seek comment on licensing RSUs by geographic areas or by site-by-site licensing. We also invite commenters to propose other methods for licensing RSUs. For instance, we seek comment on whether we should license RSUs by rule.²³¹

48. To the extent we adopt geographic area licensing, we seek comment on the appropriate geographic area to be used. When establishing geographic service areas, we must balance the competing need to provide large enough service areas and the need to choose geographic licensing areas that will permit the dissemination of licenses among a wide variety of applicants.²³² We also wish to ensure service to rural areas²³³ and to promote investment in and rapid deployment of new technologies and services.²³⁴ The Commission licenses spectrum using a wide variety of geographic areas. The 800 MHz cellular radiotelephone services are licensed using Metropolitan and Rural Service Areas (MSAs and RSAs).²³⁵ The 24 GHz band is licensed by Economic Areas (EAs).²³⁶ The 2.3 GHz band is licensed

²²⁶ *ULS Report and Order*, 13 FCC Rcd 21027.

²²⁷ Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010, WT Docket No. 96-86, *Third Memorandum Opinion and Order and Third Report and Order*, 15 FCC Rcd 19844, 19869 ¶ 54-55 (2002).

²²⁸ *Id.* at ¶ 57.

²²⁹ *Id.* at ¶¶ 54-55.

²³⁰ *BBA Report and Order*, 15 FCC Rcd 22709, 22725-22726 ¶ 32.

²³¹ *See infra* para. 54 for a discussion of licensing by rule.

²³² *See* 47 U.S.C. §§ 309(j)(3)(B), (4)(C).

²³³ *See* 47 U.S.C. § 309(j)(3)(A).

²³⁴ *See* 47 U.S.C. § 309(j)(4)(C)(iii).

²³⁵ *See* Report No. CI-92-40, Common Carrier Public Mobile Services Information, Cellular MSA/RSA Markets and Counties, dated January 24, 1992, DA 92-109, *Public Notice*, 7 FCC Rcd 742 (1992). *See also* 47 C.F.R. § 22.909. There are 734 MSAs and RSAs.

²³⁶ *See* Amendments to Parts 1, 2, 87, and 101 of the Commission's Rules to License Fixed Services at 24 GHz, WT Docket No. 99-327, *Report and Order*, 15 FCC Rcd 16934, 16942-16944 (2000) (*24 GHz Report and Order*). There are 172 EAs, as defined by the U.S. Department of Commerce, and three additional Commission- (continued....)

using the twelve Regional Economic Area Groupings (REAs) and the 52 Major Economic Areas (MEAs) which are derived from EAs.²³⁷ The 746-764 MHz and 776-794 MHz bands are licensed by six Economic Area Groupings (EAGs), which are derived from EAs.²³⁸ We seek comment on whether we should adopt a geographic area licensing scheme for public safety and non-public safety radio licensees. Commenters should address whether we should adopt separate geographic area licensing schemes for public safety and non-public safety radio licensees. For instance, it may be more advantageous to license the public safety licenses by a geopolitical area such as by State or metropolitan area. Such a scheme, however, may not benefit non-public safety radio licensees; it may be more advantageous to license the non-public safety radio portion by EA²³⁹ or by metropolitan statistical areas (MSAs) and rural service areas (RSAs), or nationally. Commenters should suggest the most appropriate area for public safety and non-public safety radio licensees. Commenters should also address whether we should adopt one scheme for both public safety and non-public safety radio licensees and suggest the most appropriate scheme.

49. We also seek comment on the appropriate entities to hold public safety DSRC licenses. One possible licensing scheme would be to license all public safety DSRC operations in the 5.9 GHz band to a State-level agency responsible for administering the transportation infrastructure. With respect to the 700 MHz public safety band, the Commission found that a state licensing scheme reduces the administrative burden on both the Commission and the public safety community.²⁴⁰ Because the state licensing approach was used in the 700 MHz proceeding, we expect that states will have spectrum management capabilities already in place. State licensing, however, has certain potential drawbacks. State licensing would impose additional spectrum management duties upon state agencies. We therefore seek comment on whether this approach places unduly burdensome responsibilities upon the states, as well as on what alternative licensing mechanism we should employ if a state is unwilling or unable to administer such a license. Hence, we seek comment on whether we should establish guidelines to ensure that states do not unduly restrict the access of other eligible entities to this spectrum. We also seek comment on whether we should license this spectrum as was done in the 700 MHz band, in which states were given a window to apply for a state license and at the end of that period, unclaimed spectrum would revert to a Regional Planning Committee. Commenters should specifically address whether such an approach is feasible and appropriate, and if so, what entity should be designated the default licensee in those cases in which a state does not file for its license. Commenters should also discuss the other advantages and disadvantages of this scheme, as identified herein or otherwise.

50. Another licensing scheme that would allow the designation of a licensee for coordination purposes with minimal administrative burden on end users would be to license public safety DSRC operations through the use of regional planning committees. Under a regional planning licensing scheme, which the Commission used in both the 700 MHz and 800 MHz public safety bands, the nation is divided

(Continued from previous page) _____

defined EA-like areas. The three additional EA-like service areas are: (1) Guam and the Northern Mariana Islands (combined as one service area); (2) Puerto Rico and the United States Virgin Islands (combined as one service area); and (3) American Samoa.

²³⁷ See 47 C.F.R. § 27.6. See also, *Part 27 Report and Order*, 12 FCC Rcd at 10814-16 ¶¶ 54-60. At the time of the 2.3 GHz auction, REAs were defined as Regional Economic Area Groupings (REAGs).

²³⁸ See Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, WT Docket No. 99-168, *First Report and Order*, 15 FCC Rcd 476, 500 ¶ 56 (*700 MHz First Report and Order*).

²³⁹ See *supra* n. 236.

²⁴⁰ See *700 MHz Fourth NPRM*, 15 FCC Rcd at 16909 ¶ 21.

into regions that have the autonomy to develop plans that meet their different communications needs.²⁴¹ Based on the experience gained from the implementation of this plan in the 700 MHz and 800 MHz bands, we seek comment on whether we should employ regional planning committee licensing in the 5.9 GHz band. Also, we request comment on whether some of this spectrum should be administered under Part 15, and if so, how much. We note here that the issue of the most appropriate band plan is linked, to a certain extent, to the issue of how we will license the spectrum.²⁴²

2. On Board Units

51. According to the July *Ex Parte* Comments, “[e]quipping every new vehicle sold in the United States with On-Board Units is a primary goal of DOT and ITS America.”²⁴³ As mentioned above, there are two types of OBUs, those associated with a specific fixed system and those not associated with a fixed system. ITS America recommends that we propose to license both types of OBUs by rule.²⁴⁴ ITS America recommends against permitting any unlicensed DSRC operations because the dominant use of the band will be for public safety, which will not be able to tolerate interference.²⁴⁵ Moreover, ITS America maintains that unlicensed DSRC operations would threaten the integrity of the 5.9 GHz band for its intended purposes.²⁴⁶

52. With respect to OBUs associated with a specific fixed system, we seek comment on licensing those OBUs under the associated RSU license. We ask commenters whether an applicant for an RSU license should also request a specific number of OBUs, or whether an RSU license should automatically confer upon the RSU licensee the right to operate an unlimited number of OBUs in connection with its system.

53. For OBUs not associated with a specific fixed system, we seek comment on whether they should be unlicensed under Part 15 or licensed by rule. Below is a description of these two options. Notwithstanding ITS America’s concerns, we believe it is appropriate to seek comment on allowing OBUs to operate as unlicensed devices pursuant to Part 15 of the Commission’s Rules. Part 15 contains the technical requirements for radiofrequency devices that may be operated without individual licenses.²⁴⁷ The requirements include radiated emission limits for intentional radiators, such as transmitters, and for unintentional radiators, such as radio receivers, computers, and VCRs.²⁴⁸ The limits are intended to minimize the possibility of unlicensed Part 15 devices causing interference to licensed radio services.²⁴⁹ Part 15 of the rules requires that most devices that intentionally emit radiofrequency radiation be certified

²⁴¹ See *700 MHz First R&O*, 14 FCC Rcd at 190 ¶ 77 citing *800 MHz R&O*, 3 FCC Rcd at 906.

²⁴² See Part 15 licensing discussion at para. 53, *infra*.

²⁴³ July *Ex Parte* Comments at 45.

²⁴⁴ *Id.* at 54.

²⁴⁵ *Id.* at 58.

²⁴⁶ *Id.*

²⁴⁷ Review of Part 15 and Other Parts of the Commission’s Rules, ET Docket 01-278, *Notice of Proposed Rulemaking*, 16 FCC Rcd 18205, 18207 ¶ 6 (2001).

²⁴⁸ *Id.*

²⁴⁹ *Id.*

before they can be marketed.²⁵⁰ We note that the Commission's Rules already permit a variety of unlicensed operations in the 5.725-5.875 GHz range.²⁵¹ Unlicensed applications under Part 15 may not be appropriate, however, to license OBUs of some DSRC-based ITS applications because the OBUs would have to accept interference from and not cause interference to operations, particularly any service with allocated status such as the Part 90 DSRC-based ITS operations.²⁵² Nevertheless, as the Commission noted in the *Allocation Report and Order*, "low power unlicensed DSRC could benefit some applications, such as fee collection at parking garages and commercial establishments."²⁵³ We seek comment on whether OBUs not associated with an RSU should be permitted to operate under Part 15.

54. We also seek comment on licensing OBUs by rule. When a service is licensed by rule, no licenses are issued and frequency coordination is generally not used.²⁵⁴ Licensing by rule must be authorized by Congress, and is appropriate only for low-power, short-distance services with multiple, shared channels, where users can avoid congestion fairly easily.²⁵⁵ Congress has authorized, through Section 307(e) of the Act,²⁵⁶ licensing by rule in the Citizens Band (CB) Radio Service and in the Radio Control Services, among others, not relevant here.²⁵⁷ Therefore, to use a license by rule scheme to license OBUs not associated with a fixed system, we would be required to classify such OBUs in either the Citizens Band Radio Service or the Radio Control Service. Section 307(e)(3) authorizes the Commission to define the Citizens Band Radio Service and the Radio Control Service, which the Commission has done.²⁵⁸ The Commission defines the Citizens Band Radio Service as "a private, two-way, short-distance voice communications service for personal or business activities of the general public."²⁵⁹ In the CB Radio Service, users may transmit communications about their personal or business activities, emergencies, and traveler assistance, but users must limit their communications to the minimum practicable time.²⁶⁰ The Commission defines the Radio Control Service as "a private, one-way, short distance non-voice communications service for the operation of devices at remote locations."²⁶¹ We seek comment on whether the DSRC service meets the definition of CB service or Radio Control Service. We seek comment on whether licensing by rule would be an appropriate licensing scheme for OBUs not associated with an RSU.

²⁵⁰ *Id.* at ¶ 34.

²⁵¹ *See Allocation Report and Order* at 18234 ¶ 28. *See also* 47 C.F.R. 15.245, 15.247, and 15.249.

²⁵² *See Allocation Report and Order* at 18234 ¶ 28.

²⁵³ *Id.* at 18235 ¶ 30.

²⁵⁴ *BBA NPRM*, 14 FCC Rcd 5206, 5218-5219 ¶ 17.

²⁵⁵ *Id.*

²⁵⁶ 47 U.S.C. §307(e)(1).

²⁵⁷ Licensing by rule is also authorized in the aviation radio service and in the maritime radio service. *See* 47 U.S.C. §307(e)(1).

²⁵⁸ 47 U.S.C. §307(e)(3).

²⁵⁹ 47 C.F.R. § 95.401(a).

²⁶⁰ *BBA NPRM*, 14 FCC Rcd 5206, 5218-5219 ¶ 17.

²⁶¹ 47 C.F.R. § 95.201.

3. Treatment of Incumbent Services

55. *Fixed Satellite Service*. In its comments to the *Allocation NPRM*, DOT indicated that an allocation of seventy-five megahertz of spectrum was necessary for DSRC operations because of the potential of two incumbents, high power military radar systems and Fixed Satellite Service (FSS) uplinks, to interfere with, and therefore impede the reliability of DSRC operations.²⁶² DOT indicated that FSS uplinks “suggest a potential interference range of several hundred miles.”²⁶³ Only by allocating the full seventy-five megahertz for DSRC, DOT stated, would assure “compatibility with primary incumbent users.”²⁶⁴ Accordingly, in allocating the 5.9 GHz band for DSRC operations the Commission noted, in part, that seventy-five megahertz of spectrum “will provide the flexibility needed to share the spectrum with incumbent operations.”²⁶⁵ The Commission further found that DSRC operations would be compatible with FSS uplinks because FSS earth stations typically use highly directional antennas pointed towards the geostationary orbital arc, whereas DSRC operations would typically be pointed towards a highway and operate at relatively low power.²⁶⁶ The Commission further noted that it may be necessary in some cases for DSRC operations to avoid an area near an incumbent FSS earth station in order to avoid the high-powered earth station transmission.²⁶⁷ Nonetheless the Commission concluded that spectrum sharing is feasible because of the limited number of FSS earth stations and their use of highly directional antennas.²⁶⁸ The Commission further concluded that it did not anticipate that prior coordination would be necessary between DSRC and FSS operations.²⁶⁹

56. On December 27, 1999, PanAmSat filed a Petition for Reconsideration or Clarification of the *Allocation Report and Order* concerning the Commission’s statements on whether prior coordination is needed between DSRC operations and FSS systems.²⁷⁰ PanAmSat stated:

[t]he Commission appears to believe that the only coordination issue raised by a DSRC allocation in the FSS bands relates to whether interference could prevent DSRC systems from locating near incumbent FSS uplinks. In fact, however, absent a coordination procedure the widespread deployment of DSRC terminals could give rise to broad exclusion zones within which FSS operators could not deploy new earth stations. Among other things, such exclusion zones could prevent teleport operators from expanding their operations at sites in which they already have invested millions of dollars.

²⁶² DOT Comments at 2.

²⁶³ *Id.*

²⁶⁴ United States Department of Transportation Reply Comments to ET Docket No. 98-95 at 3. DOT further cited an ARINC study that “in order to avoid potential interference from incumbent users in the 5.9 GHz band, an allocation of 75 MHz” was necessary “as a practical matter.” *Id.* at 2.

²⁶⁵ *Allocation Report and Order*, 14 FCC Rcd at 18225 ¶ 9.

²⁶⁶ *Id.* at 18228 ¶ 15.

²⁶⁷ *Id.*

²⁶⁸ *Id.*

²⁶⁹ *Id.*

²⁷⁰ PanAmSat Corporation, Petition for Reconsideration or Clarification (filed Dec. 27, 1999) (PanAmSat Petition).

PanAmSat is not wedded to any particular method for coordinating DSRC and FSS stations. It is PanAmSat's understanding, however, that the DSRC industry is at an embryonic stage, and one possibility would be for DSRC systems to be developed taking into account the 'noise floor' that is present from FSS uplink operations. FSS and DSRC stations then could be located without having to engage in site-by-site coordination.²⁷¹

The Satellite Industry Association (SIA)²⁷² filed in support PanAmSat's petition. SIA stated that

[b]ased on the technical rules adopted by the Commission, it appears unlikely that DSRC systems will cause significant interference to FSS uplink operations. However, if sited in proximity to an FSS earth station, DSRC systems may well receive harmful interference from FSS uplinks. This not only could inhibit the deployment of DSRC stations, but it also could lead to band sharing disputes when FSS earth station operators expand or modify their facilities.²⁷³

57. Although ITS America believes that prior coordination of "all DSRC-based ITS and FSS operations is likely not necessary and, indeed, would be unduly burdensome and costly,"²⁷⁴ we agree with PanAmSat that the widespread deployment of DSRC terminals could limit where new FSS earth stations can be located. Therefore, we seek comment on whether prior coordination would be necessary and, if so, under what conditions. For example, should all new FSS earth stations be prior-coordinated with DSRC operations (except for new earth stations to be located at existing earth station teleport sites)? If some type of prior coordination is necessary or appropriate, commenters should address how to accomplish such coordination with minimal burden and cost, especially considering the mobile nature of the DSRC service. In light of incumbent and potential future FSS operations, commenters also are asked to address whether the ASTM-DSRC Standard would provide for robust and reliable DSRC operations. In this connection, we seek information on whether DSRC equipment and operations should take into account the "noise floor" that is present from FSS uplink transmissions. If such approach were taken, commenters should indicate whether the current DSRC standards are adequate and, if not, what changes would be necessary to those standards to allow sharing of this spectrum without any coordination. Of particular interest is whether FSS uplink transmissions in the 5.9 GHz band would interfere with the DSRC Control Channel.²⁷⁵

58. In the *Allocation Report and Order* the Commission stated that sharing between DSRC operations and Government operations was possible if proper coordination was performed. Accordingly, Section 90.371(b) of the Rules requires that DSRC stations operating in the 5.9 GHz band "shall not receive protection from Government Radiolocation services in operation prior to the establishment of the DSRC station."²⁷⁶ Section 90.371(b) further requires that "[o]peration of DSRC stations within 75

²⁷¹ *Id.* at 2.

²⁷² Comments of Satellite Industry Association, ET Docket No. 98-95 (supporting PanAmSat Petition)

²⁷³ *Id.* at 2.

²⁷⁴ Comments of ITS America, ET Docket No. 98-95 (opposing PanAmSat Petition).

²⁷⁵ As noted in para. 3, *supra*, we dismiss PanAmSat's Petition for Reconsideration or Clarification as moot because we are addressing the issues raised in that petition in this service rules *Notice*.

²⁷⁶ 47 C.F.R. § 90.371(b).

kilometers of the location listed” in the table accompanying to Section 90.371(b) “must be coordinated through the National Telecommunications and Information Administration.”²⁷⁷ New government radar installations that may be deployed subsequent to DSRC implementation must coordinate with incumbent DSRC operations.²⁷⁸ One issue not addressed in the *Allocation Report and Order* is whether specific provisions need to be adopted to forestall interference from new high power Government radar operations to the DSRC Control Channel. We therefore seek comment on this issue.

F. Grant of Licenses

59. The Balanced Budget Act of 1997²⁷⁹ (BBA-97) revised and expanded the Commission’s auction authority.²⁸⁰ Specifically, it amended Section 309(j) of the Communications Act to require the Commission to grant licenses through the use of competitive bidding when mutually exclusive applications for initial licenses are filed, unless certain specific statutory exemptions listed in Section 309(j)(2) apply.²⁸¹ BBA-97 also added to Section 309(j)(1) a reference to the Commission’s obligation under Section 309(j)(6)(E) to use engineering solutions, negotiation, threshold qualifications, service regulations, or other means to avoid mutual exclusivity where it is in the public interest to do so.²⁸² BBA-97 did not amend Section 309(j)(3)’s directive to consider certain public interest objectives in identifying classes of licenses and permits to be issued by competitive bidding.²⁸³

60. In the *BBA Report and Order*, the Commission established a framework for exercise of its auction authority, as amended by the Balanced Budget Act.²⁸⁴ The *BBA Report and Order* affirmed that, in identifying which classes of licenses should be subject to competitive bidding, the Commission is required to pursue the public interest objectives set forth in Section 309(j)(3).²⁸⁵ The *BBA Report and Order* also affirmed that, as part of this public interest analysis, the Commission must continue to consider alternative procedures that avoid or reduce the likelihood of mutual exclusivity.²⁸⁶ The Commission concluded, however, that its obligation to avoid mutual exclusivity does not preclude it from

²⁷⁷ *Id.*

²⁷⁸ *Allocation Report and Order*, 14 FCC Rcd 18221, 18228 ¶14.

²⁷⁹ Pub. L. 105-33, 111 Stat. 251 (1997).

²⁸⁰ *See* 47 U.S.C. § 309(j)(1), (2) (as amended by Balanced Budget Act, § 3002).

²⁸¹ *Id.* 47 U.S.C. § 309(j)(2) exempts from auctions licenses and construction permits for public safety radio services, digital television service licenses and permits given to existing terrestrial broadcast licensees to replace their analog television service licenses, and licenses and construction permits for noncommercial educational broadcast stations and public broadcast stations described in § 397(6) of the Communications Act, 47 U.S.C. § 397.

²⁸² *See* 47 U.S.C. §§ 309(j)(1), 309(j)(6)(E).

²⁸³ *See* 47 U.S.C. § 309(j)(3).

²⁸⁴ *See BBA Report and Order*, 15 FCC Rcd at 22709.

²⁸⁵ *Id.* at 22718-22723.

²⁸⁶ *Id.*

adopting licensing processes in the non-exempt services that result in the filing of mutually exclusive applications where it determines that such an approach would serve the public interest.²⁸⁷

61. In determining whether to grant licenses through competitive bidding in this proceeding, *i.e.*, WT Docket 01-90, we intend to follow the approach set forth in the Balanced Budget Act proceeding regarding the exercise of our auction authority. We note, too, that subsequent to the adoption of the Balanced Budget Act, the U.S. Court of Appeals for the D.C. Circuit concluded that the Section 309(j)(6)(E) obligation does not foreclose new licensing schemes that are likely to result in mutual exclusivity.²⁸⁸ The court stated that if the Commission finds such schemes to be in the public interest, it may implement them “without regard to [S]ection 309(j)(6)(E) which imposes an obligation only to minimize mutual exclusivity ‘in the public interest,’ and ‘within the framework of existing policies.’”²⁸⁹

62. The Commission’s competitive bidding authority does not extend to public safety radio services, as defined in Section 309(j)(2) of the Act. In the *BBA Report and Order*, the Commission not only provided guidance regarding the scope of the public safety exemption, the Commission discussed “the factors we will consider in assessing its applicability to future situations,”²⁹⁰ as is the case here. The Commission noted that “[b]ecause the applicability of the exemption to any service must be decided before the service is licensed, our analysis in each case must be based on the use and eligibility rules that we establish for the service.”²⁹¹ The Commission reaffirmed that conclusion in the *BBA MO&O*, in which the Commission noted that “[w]ith respect to spectrum to be used for new services, we intend to adopt service rules that will specifically determine whether the service qualifies as a public safety radio service and is therefore exempt from competitive bidding. That is, when we designate spectrum as a public safety radio service, we intend to limit the permitted uses to those that Congress intended for auction-exempt spectrum (or some subset thereof).”²⁹² Moreover, the Commission reaffirmed its conclusion that the exemption applies to radio “services” rather than individual classes of users, which the Commission stated was supported by the court’s “plain language” analysis in *National Public Radio, Inc. v. FCC*.²⁹³

²⁸⁷ *Id.*

²⁸⁸ See *Benkelman Telephone Co., et al. v. FCC*, 220 F.3d 601, 606 (D.C. Cir. 2000), *petition for rehearing on other grounds pending*.

²⁸⁹ *Id.* (citations omitted) *citing DIRECTV, Inc. v. FCC*, 110 F.3d 816, 828 (D.C. Cir. 1997).

²⁹⁰ *BBA Report and Order*, 15 FCC Rcd 22709, 22741 ¶ 66.

²⁹¹ *Id.*

²⁹² *BBA MO&O*, 17 FCC Rcd at 7569 ¶ 38 (2002).

²⁹³ *National Public Radio, Inc. v. FCC*, 254 F.3d 226 (D.C. Cir. 2001). Section 309(j)(2)(C), which specifically exempts noncommercial educational broadcasters (NCE) from competitive bidding, differs from Section 309(j)(2)(A), which exempts public safety radio services. Under Section 309(j)(2)(C) licenses or construction permits for NCE “stations” are exempt from competitive bidding, whereas, under Section 309(j)(2)(A), licenses or construction permits for public safety radio “services” are exempt. Thus, the Commission concluded that the “NPR court’s ‘plain language’ analysis supports the Commission’s interpretation of Section 309(j)(2)(A) set forth” in the *BBA Report and Order*. *BBA MO&O*, 17 FCC Rcd at 7564 ¶ 27.

G. Application, Licensing and Processing Rules

1. Licensing

63. We propose to apply the application, licensing, and processing rules set forth in Part 90, Subpart G of the Commission's Rules for public safety licensees. We further propose to apply the application, licensing, and processing rules set forth in Part 90, Subpart G of the Commission's Rules for non-public safety licensees, in the event that we select a licensing scheme that does not result in mutually exclusive applications. We seek comment on these proposals. We note that Section 90.371(b)²⁹⁴ of the Commission's Rules requires that "[o]peration of DSRC stations within 75 kilometers of the location listed" in the table included with Section 90.371(b) "must be coordinated through the National Telecommunications and Information Administration."²⁹⁵

2. Construction or Coverage/Service Requirements; License Term; Renewal Expectancy

64. ITS America recommends that we require that authorized public safety and non-public safety radio RSUs be placed in operation within 12 months from the date of license grant or the authorization cancels automatically and must be returned to the Commission.²⁹⁶ ITS America contends, however, that a public safety licensee seeking authorization to construct and operate RSUs to serve a single physical facility or in a ribbon or corridor should be able to seek an extended deployment period in accordance with Section 90.629 of the Commission's Rules.²⁹⁷

65. We seek comment on whether, if we elect site-based licensing, construction requirements for DSRC operations in the 5.9 GHz band are necessary; and, if so, what construction periods are appropriate. We also request comment on whether public safety and non-public safety licensees should have the same or different construction requirements. ITS America recommends a license term of ten years.²⁹⁸ In this connection, we seek comment on this proposal. Commenting parties are asked to discuss whether a shorter or longer license term is appropriate; and, if so, on what rationale.

66. If we license a portion of the 5.9 GHz band by geographic area, should there be a coverage requirement; and, if so, what benchmarks are appropriate in that instance? Specifically, should such licensees be subject to either a substantial service requirement or a minimum coverage requirement as a condition of license renewal. We have imposed such requirements on licensees in other services to ensure that spectrum is used effectively and service is implemented promptly.²⁹⁹ We seek comment on whether licensees should be required to provide "substantial service" to the geographic license area within ten years or any other license term which we adopt for this service.³⁰⁰ We have defined substantial

²⁹⁴ For a more complete discussion, *see* para. 58 *supra*.

²⁹⁵ 47 C.F.R. § 90.371(b).

²⁹⁶ July *Ex Parte* Comments at 66, *citing* 47 C.F.R. § 90.155.

²⁹⁷ *Id.*, *citing* 47 C.F.R. § 90.629.

²⁹⁸ *Id.*

²⁹⁹ *Cf.* Section 22.940(a)(2)(i) through Section 22.940(a)(2)(iv) of the Commission's Rules, 47 C.F.R. §§ 22.940(a)(2)(i)-(iv).

³⁰⁰ *See LMDS Second Report and Order*, 12 FCC Rcd at 12659 ¶¶ 263-267.

service as "service which is sound, favorable, and substantially above a level of mediocre service which just might minimally warrant renewal."³⁰¹

3. Universal Licensing System

67. We also note that applications in this service will be filed using the Universal Licensing System (ULS).³⁰² ULS is the Commission's automated licensing system and integrated database for wireless services. ULS includes consolidated applications forms, which will enable licensees and applicants to file applications electronically, thus increasing the speed and efficiency of the application process. All licensees filing applications and other filings using FCC Forms 601 through 605 or associated schedules must make these filings in accordance with ULS.³⁰³ Use of ULS will permit Commission staff to process filings more efficiently and will enhance the availability of pertinent licensing information to the public.

H. Technical Rules

1. Power limits and emission mask requirements

68. The *Allocation Report and Order* established power limits and emission masks for DSRC operations,³⁰⁴ but deferred any decision on frequency stability requirements to a future proceeding.³⁰⁵ Accordingly, the Commission amended Sections 90.205 and 90.210 of the Commission's Rules. Section 90.205(m) of the Commission's Rules states that:

The peak transmit output power over the frequency band of operations shall not exceed 750 mW or 28.8 dBm with up to 16 dBi in antenna gain. If transmitting antennas of directional gain greater than 16 dBi are used, the peak transmit output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 16 dBi, *i.e.*, the device's maximum EIRP shall not exceed 30 W EIRP. However, the peak transmitter output power may be increased to account for any line losses due to long transmission cables between the transmitter and the DSRC device's antenna, provided the EIRP does not exceed 30 W.³⁰⁶

Section 90.210(k)(3) states that:

For . . . transmitters authorized under subpart M that operate . . . for Dedicated Short Range Communication Services in the 5.850-5.925 GHz band, the peak power of any emission shall be attenuated below the power of the highest emission contained within the licensee's sub-band in accordance with the following schedule:

- (i) On any frequency within the authorized bandwidth: Zero dB.

³⁰¹ See, e.g., 47 C.F.R. § 22.940(a)(1)(i).

³⁰² See *ULS Report and Order*, 13 FCC Rcd 21027.

³⁰³ 47 C.F.R. § 1.913(b).

³⁰⁴ *Allocation Report and Order*, 14 FCC Rcd 18221, 18232 ¶ 24.

³⁰⁵ *Id.* at 18234 ¶ 26.

³⁰⁶ 47 C.F.R. § 90.205(m).

(ii) On any frequency outside the licensee's sub-band edges: $55 + 10 \log(P)$ dB, where (P) is the highest emission (watts) of the transmitter inside the licensee's sub-band.³⁰⁷

In response to the *Allocation Report and Order*, Mark IV Industries requested that we clarify the power limits and emission mask requirements.³⁰⁸ Specifically, Mark IV Industries states that the 750 milliwatts (28.8 dBm) maximum antenna input power limit is overly restrictive.³⁰⁹ Mark IV Industries recommends that an antenna input power of up to 4 watts (36 dBm) be allowed with no change to the maximum EIRP of 30 watts.³¹⁰ Mark IV proposes that we replace the language of Section 90.205(m)³¹¹ with:

The antenna input power shall not exceed 4 watts or 36 dBm with up to 8 dBi of antenna gain. If transmitting antennas of directional gain greater than 8 dBi are used, the peak antenna input power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 8 dBi, i.e. the device's maximum EIRP shall not exceed 30 watts EIRP.³¹²

69. ITS America, however, states that proposed transmitter power limits in the ASTM-DSRC Standard conform to the limits adopted by the Commission in the *Allocation Report and Order*.³¹³ ITS America maintains that most RSUs and OBUs "are expected to use less power than the maximum established by the Commission: 28.8 dBm (750 mW), measured at the antenna input, and 30 watts (44.8 dBm) of EIRP."³¹⁴ In addition, ITS America recommends that the Commission adopt specific limitations on channels and categories of applications, based on the type of application and the needed transmission distance.³¹⁵ Specifically, ITS America recommends that the Commission adopt the following limitations:

- Public safety and private RSUs operating on Channels 174, 175, and 176 should be used for small and medium range operations. Any RSU operating on these channels should not exceed 28.8 dBm antenna input power and 33 dBm EIRP.
- Private RSUs operating on Channel 178 should not exceed 28.8 dBm antenna input power and 33 dBm EIRP.

³⁰⁷ 47 C.F.R. § 90.210(k)(3).

³⁰⁸ Mark IV Industries, Limited, I.V.H.S. Division, Petition for Clarification (filed Dec. 27, 1999) (Mark IV Petition).

³⁰⁹ Mark IV Petition at 2.

³¹⁰ *Id.*

³¹¹ 47 C.F.R. § 90.205(m).

³¹² Mark IV Petition at 2.

³¹³ July *Ex Parte* Comments at 68.

³¹⁴ *Id.* at 68-69.

³¹⁵ *Id.* at 69.

- Public Safety RSUs operating on Channel 178 should not exceed an antenna input power of 28.8 dBm and 44.8 EIRP.
- Channels 180, 181, and 182 should not be used for small zone operations. Public safety and private RSUs operating on these channels should not exceed 10 dBm antenna input power and 23 dBm EIRP. These RSUs should also use an antenna with a minimum 6 dBi gain.
- Public safety RSUs operating on Channel 184 should not exceed 28.8 dBm antenna input power and 40 dBm EIRP. Private RSUs operating on Channel 184 should not exceed an antenna input power of 28.8 dBm and 33 dBm EIRP.
- Private OBUs operating on Channels 172, 174, 175, 176, 178, and 184 should not exceed 28.8 dBm antenna input power and 33 dBm EIRP. Private OBUs operating on Channels 180, 181, and 182 should not exceed 20 dBm antenna input power and 23 dBm EIRP.
- Public safety OBUs operating on Channels 172, 174, 175, and 176 should not exceed 28.8 dBm antenna input power and 33 dBm EIRP.
- Public safety OBUs operating on Channel 178 should not exceed 28.8 dBm antenna input power and 44.8 dBm EIRP.³¹⁶

We seek comment on whether any changes to our rules relating to power limits are necessary. We specifically seek comment on ITS America's and Mark IV's proposals.³¹⁷

2. Emissions Limits

70. Mark IV Industries also requested that we clarify the emission mask requirements of Section 90.210 of the Commission's Rules³¹⁸ "to provide that compliance measurements may be conducted at the transmission line output/antenna input to take into account . . . the relatively long transmission lines anticipated in certain types of DSRC operations."³¹⁹ Mark IV recommends that the "out-of-band emission attenuation limits . . . be referenced to" the transmission line output/antenna input "but only for the highest permitted power of operation."³²⁰ Accordingly, Mark IV recommends that Section 90.210(k)(3) be revised to read:

. . . with the following schedule:

On any frequency within the authorized bandwidth: Zero dB

³¹⁶ *Id.*

³¹⁷ As noted in para. 3, *supra*, we dismiss PanAmSat's Petition for Reconsideration or Clarification as moot because we are addressing the issues raised in that petition in this service rules *Notice*.

³¹⁸ 47 C.F.R. § 90.210.

³¹⁹ Mark IV Petition at 2.

³²⁰ *Id.* at 3.

On any frequency outside the licensee's sub-band edges: the lesser of $(55 + 10 \log(P))$ or 61 dB; where (P) is the highest emission (watts) of the transmitter in the licensee's sub-band.³²¹

We seek comment on this recommendation. We seek comment on whether such a change, if adopted, would increase the risk of interference potential.

71. ITS America states that the ASTM-DSRC Standard meets Section 90.210(k) of the Commission's Rules.³²² Specifically, ITS America states that under the ASTM-DSRC Standard, the power in the transmitted spectrum should be -25dBm or less in 100 kHz outside all channel and band edges.³²³ ITS America further asserts that this is accomplished by attenuating the transmitted signal in 100 kHz outside the channel and band edges by $55 + 10 \log(P)$ dB, where P is the total transmitted power in watts.³²⁴ We seek comment on this recommendation.

3. Antenna Height

72. ITS America recommends that the Commission adopt technical rules regarding the location of antennas on RSUs.³²⁵ ITS America states that in most instances it is expected that directional antennas will be used, but the ITS community is concerned that antennas, whether directional or omnidirectional, especially those with higher transmitter power levels, placed higher than six meters above the roadway bed surface³²⁶ might interfere with adjacent or overlapping communication zones.³²⁷ Consequently, ITS America recommends that the Commission amend Part 90 of the Commission's Rules to include a formula to compensate for increased height where an antenna stands between six and fifteen meters above the roadway bed surface.³²⁸ Specifically, ITS America recommends that the Commission adopt the following antenna height correction factor:

Reduced authorized effective radiated power ("ERP") by a factor of $20 \log(Ht/6)$ in dB where Ht is the height of the radiation center of the antenna in meters above the roadway bed surface where the antenna height is between 6 and 15 meters (or $6m < Ht < 15m$). ERP is measured as the maximum ERP toward the horizon or horizontal, whichever is greater, of the gain associated with the main or center of the transmission beam. The maximum authorized effective isotropic radiated power ("EIRP") is 33 dBm for any Roadside Unit

³²¹ July *Ex Parte* Comments at 73.

³²² *Id.* at 73.

³²³ *Id.* We assume that the "100 kHz" refers to the resolution bandwidth of the instrumentation used to measure the emission power. See 47 C.F.R. § 90.210(k)(4).

³²⁴ July *Ex Parte* Comments at 73.

³²⁵ *Id.* at 69.

³²⁶ According to ITS America the transportation community generally uses the term "roadway bed surface" to refer to the road surface at ground level, as opposed to the road surface on a bridge or on an overpass. ITS America further states that measuring the height of a RSU antenna above the roadway bed surface more accurately measures the antenna height in relation to the location of traveling vehicles. *Id.* at n.132.

³²⁷ *Id.* at 70.

³²⁸ *Id.* at 71

installation where the antenna height is six meters or greater above the roadway bed surface. A waiver of the antenna height correction factor, and the resulting height-gain power reduction, may be requested for an antenna height greater than six meters above the roadway bed surface and must be accompanied by an engineering study justifying such a waiver. Waivers can be recommended at the discretion of a frequency coordinator upon a determination that the proposed Roadside Unit installation will follow reasonable and generally accepted engineering practices and that potential co-channel interference is properly minimized.³²⁹

We note that this assumes site-by-site licensing. We seek comment on ITS America's antenna height correction factor recommendation. Commenters should address how the correction factor would affect coverage? We seek comment on whether this recommendation would be necessary if we were to adopt a geographic area licensing scheme.

4. Frequency Stability Limits

73. As mentioned above, the Commission did not adopt frequency stability limits in the *Allocation Report and Order* because the Commission was not able to establish a channelization plan.³³⁰ Consequently, we seek comment on the frequency stability limits that we should adopt to prevent DSRC-based ITS applications from causing interference to DSRC-based ITS applications on other channels or other services in nearby spectrum. In that connection, we note that the ASTM-DSRC Standard specifies that the transmitter center frequency tolerance shall be plus or minus 10 ppm for RSUs and OBUs.³³¹

I. Canadian and Mexican Coordination

74. Sections 2.301 and 1.923 (f) of our Rules requires stations using radio frequencies to identify their transmissions with a view to eliminating harmful interference and to generally enforce applicable radio treaties, conventions, regulations, arrangements, and agreements.³³² At this time, international agreements between and among the United States, Mexico, and Canada³³³ concerning the 5.9 GHz spectrum for ITS applications have not been established. Although the agreement with the Canadian Government, "Agreement Concerning the Coordination and Use of Radio Frequencies Above Thirty Megacycles per Second," with Annex, as amended,³³⁴ applies to the 5.85-5.925 GHz band, no agreement is in place for the current ITS allocation. Consequently, licensees may be subject to future agreements

³²⁹ *Id.* at 72.

³³⁰ *Allocation Report and Order*, 14 FCC Rcd 18221, 18233 ¶ 26.

³³¹ ASTM-DSRC Standard at 27, § 17.3.9.4.

³³² See 47 C.F.R. § 2.301 and 1.923 (f).

³³³ ITS America reports that Industry Canada is in the process of allocating the 5.855-5.925 GHz band for DSRC applications. ITS America further reports that "Spectrum Management, Radio Standard Specification, Location and Monitoring Service," a proposed nationwide Canadian standard is expected to be adopted and would include the same channelization plan as specified in the ASTM-DSRC Standard. July *Ex Parte* Comments at 17.

³³⁴ Exchange of Notes at Ottawa, Canada, October 24, 1962. Entered into force October 24, 1962. See USA: *Treaties and Other International Acts Series* (TIAS) 5205; CAN: *Canada Treaty Series* (CTS) 1962 No. 15. *Agreement for Revision to Technical Annex to the Agreement of October 24, 1962* (TIAS 5205/CTS 1962 No. 15) Effected by Exchange of Notes at Ottawa, Canada, June 16 and 24, 1965. Entered into force June 24, 1965. USA: TIAS 5833/CAN: CTS 1962 No. 15, as amended June 24, 1965.

with Canada and Mexico and therefore may be subject to further modification. One option would be to propose certain interim requirements for terrestrial licenses along these borders, and to provide that licensees will be subject to the provisions contained within future agreements between and among the three countries. Until such time as agreements with Mexico and Canada become effective, we propose to apply the same technical restrictions at the border that we adopt for operation between service areas, *i.e.* operations must not cause harmful interference across the border. We seek comment on this issue.³³⁵

J. Competitive Bidding Procedures

75. As discussed above, consistent with our statutory mandate, we will resolve any mutually exclusive applications for non-exempt initial licenses in the 5.9 GHz band through the use of competitive bidding.³³⁶

1. Incorporation by Reference of the Part 1 Standardized Auction Rules

76. In the event that we choose a licensing scheme that results in mutually exclusive applications, we propose to conduct the auction of initial licenses in any non-exempt portion of the 5.9 GHz band in conformity with the general competitive bidding rules set forth in Part 1, Subpart Q, of the Commission's rules, and substantially consistent with the bidding procedures that have been employed in previous auctions.³³⁷ Specifically, we propose to employ the Part 1 rules governing competitive bidding design, designated entities, application and payment procedures, reporting requirements, collusion issues, and unjust enrichment.³³⁸ Under this proposal, such rules would be subject to any modifications that the Commission may adopt in its Part 1 proceeding.³³⁹ We seek comment on whether any of our Part 1 rules or other auction procedures would be inappropriate in an auction of licenses in this band.

2. Provisions for Designated Entities

77. In authorizing the Commission to use competitive bidding, Congress mandated that the Commission “ensure that small businesses, rural telephone companies, and businesses owned by members of minority groups and women are given the opportunity to participate in the provision of

³³⁵ We note that ITS America indicates that it received input from Industry Canada in preparing the Second Proposed Band Plan. *See* Second Proposed Band Plan.

³³⁶ *See supra* para. 59-62.

³³⁷ *See, e.g.*, Amendment of Part 1 of the Commission's Rules — Competitive Bidding Procedures, WT Docket No. 97-82, *Order, Memorandum Opinion and Order and Notice of Proposed Rule Making*, 12 FCC Rcd 5686 (1997); Amendment of Part 1 of the Commission's Rules — Competitive Bidding Procedures, Allocation of Spectrum Below 5 GHz Transferred from Federal Government Use, *Third Report and Order and Second Further Notice of Proposed Rule Making*, 13 FCC Rcd 374 (1997) (modified by Erratum, DA 98-419 (rel. March 2, 1998)) (*Part 1 Third Report and Order*); Amendment of Part 1 of the Commission's Rules – Competitive Bidding Procedures, *Order on Reconsideration of the Third Report and Order, Fifth Report and Order, and Fourth Further Notice of Proposed Rule Making*, 15 FCC Rcd 15293 (2000) (*Part 1 Recon. Order and Part 1 Fifth Report and Order, Fourth Further Notice of Proposed Rule Making*); Amendment of Part 1 of the Commission's Rules -- Competitive Bidding Procedures, *Seventh Report and Order*, 16 FCC Rcd 17546 (2001).

³³⁸ *See* 47 C.F.R. Section 1.2101 *et. seq.*

³³⁹ *See Fourth Further Notice of Proposed Rule Making*, 15 FCC Rcd 15293 (2000). *See also Part 1 Recon. Order and Part 1 Fifth Report and Order*, 15 FCC Rcd 15293 (2000) (recons. pending).

spectrum-based services.”³⁴⁰ In addition, Section 309(j)(3)(B) of the Act provides that, in establishing eligibility criteria and bidding methodologies, the Commission shall promote “economic opportunity and competition . . . by avoiding excessive concentration of licenses and by disseminating licenses among a wide variety of applicants, including small businesses, rural telephone companies, and businesses owned by members of minority groups and women.”³⁴¹

78. In the *Competitive Bidding Second Memorandum Opinion and Order*, the Commission stated that it would define eligibility requirements for small businesses on a service-specific basis, taking into account the capital requirements and other characteristics of each particular service in establishing the appropriate threshold.³⁴² The *Part 1 Third Report and Order*, while it standardizes many auction rules, provides that the Commission will continue a service-by-service approach to defining small businesses.³⁴³

79. The 5.9 GHz band will be used for DSRC operations, which are similar to the multilateration and non-multilateration systems offered in the LMS service. Thus, we believe that the DSRC service is likely to have capital costs comparable to those of the LMS service in the 902-928 MHz band. Therefore, we propose to use the same small business size standards the Commission applied to LMS in the 902-928 MHz band. In the *LMS Second Report and Order*,³⁴⁴ the Commission defined “small business” as an entity with average annual gross revenues for the preceding three years not to exceed \$15 million and a “very small business” as an entity with average gross revenues for the preceding three years not to exceed \$3 million.³⁴⁵ We believe that our proposed approach would provide a variety of businesses the opportunities to participate in the auction of licenses in the non-exempt portion of the 5.9 GHz band and afford licensees substantial flexibility for the provision of services with varying capital costs. If we ultimately adopt our proposed small business definitions for the 5.9 GHz band, we further propose to provide small businesses with a bidding credit of 25 percent and very small businesses with a bidding credit of 35 percent. The bidding credits we propose here are those set forth in the standardized schedule in Part 1 of our Rules.³⁴⁶ We believe that these bidding credits will provide adequate opportunities for small businesses to participate in the event we auction the non-exempt portion of the 5.9 GHz band.³⁴⁷

80. In developing these proposals, we acknowledge the difficulty in accurately predicting the market forces that will exist at the time these frequencies are licensed. Thus, our forecasts of types of

³⁴⁰ See 47 U.S.C. § 309(j)(4)(D).

³⁴¹ See 47 U.S.C. § 309(j)(3)(B).

³⁴² Implementation of Section 309(j) of the Communications Act – Competitive Bidding, PP Docket No. 93-253, *Second Memorandum Opinion and Order*, 9 FCC Rcd 7245, 7269 ¶ 145 (1994) (*Competitive Bidding Second Memorandum Opinion and Order*).

³⁴³ *Part 1 Third Report and Order*, 13 FCC Rcd at 388 ¶ 18.

³⁴⁴ Amendment of Part 90 of the Commission’s Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems, PR Docket No. 93-61, *Second Report and Order*, 13 FCC Rcd 15182, 15192-15193 ¶ 20.

³⁴⁵ We are coordinating these special small business size standards with the U.S. Small Business Administration.

³⁴⁶ In the *Part 1 Third Report and Order*, the Commission adopted a standard schedule of bidding credits, the levels of which were developed based on the Commission’s auction experience. *Part 1 Third Report and Order*, 13 FCC Rcd at 403-04 ¶ 47. See also 47 C.F.R. § 1.2110(f)(2).

³⁴⁷ *Part 1 Third Report and Order*, 13 FCC Rcd at 403-04 ¶ 47.

services that will be offered over this band may require adjustment depending upon ongoing technological developments and changes in market conditions. To the extent licensees support a different bidding credit regime, please support your proposals with relevant information on the types of system architectures that are likely to be deployed in this band, the availability of equipment, market conditions, and other factors that may affect the capital requirements of the type of services a licensee may seek to provide.

81. We also seek comment on whether the small business provisions we propose today are sufficient to promote participation by businesses owned by minorities and women, as well as rural telephone companies. To the extent that commenters propose additional provisions to ensure participation by minority-owned or women-owned businesses, they should address how such provisions should be crafted to meet the relevant standards of judicial review.³⁴⁸

K. Other Matters

82. *Intelligent Transportation Radio Service.* As mentioned above, Section 90.350 of our Rules³⁴⁹ states that “[t]he Intelligent Transportation Systems radio service is for the purpose of integrating radio-based technologies into the nation’s transportation infrastructure” We seek comment on whether Section 90.350 should be modified to refer to the “nation’s *surface* transportation infrastructure.” We note that this modification may be more consistent with the terminology used by DOT and the transportation industry. Also, it appears that such a modification may be more consistent with the two relevant statutes, ISTEA and TEA-21, which concern only surface transportation.

83. *Location and Monitoring Service.* Several commenters have expressed concern that toll authorities, which have been using DSRC-based ITS services in the 902-928 MHz band in the LMS service for electronic toll collection (ETC), may be forced to relocate to the 5.9 GHz band prematurely. The International Bridge, Tunnel and Turnpike Association (IBTTA) is concerned that this proceeding, *i.e.* WT Docket 01-90, may disrupt ITS and ETC research and development by promoting the exclusive use of 5.9 GHz band for DSRC-based ITS applications, downgrading ETC in the LMS service because of the possibility of interference, jeopardizing significant public investments in ETC in the LMS service, and delaying pending deployment of ETCs in the LMS service.³⁵⁰ TransCore Corporation notes that it is essential to maintain the current allocation for DSRC-based ITS in the 915 MHz band to accommodate the many existing ITS systems, primarily ETC systems, commercial vehicle weigh station bypass systems, electronic border crossing systems, and the early implementation of electronic commerce.³⁵¹ We do not have plans at this time to require DSRC-based ITS systems operating in the 902-928 MHz band to relocate to the 5.9 GHz band. We note that Progeny, LMS, LLC filed a petition for rulemaking regarding the Location and Monitoring Service rules, but the petition does not address relocation.³⁵²

84. *Warren Havens.* We conclude that Warren Havens’ recommendation to combine the 217-222 MHz (extended to 225 MHz), 216-217 MHz, 902-928 MHz, and 5.850-5.925 GHz bands into a multi-

³⁴⁸ See *Adarand Constructors v. Peña*, 515 U.S. 200 (1995) (requiring a strict scrutiny standard of review for Congressionally mandated race-conscious measures); *United States v. Virginia*, 518 U.S. 515 (1996) (applying an intermediate standard of review to a state program based on gender classification).

³⁴⁹ 47 C.F.R. § 90.350.

³⁵⁰ International Bridge, Tunnel and Turnpike Association Comments at 2.

³⁵¹ TransCore Corporation Comments at 2.

³⁵² See Wireless Telecommunications Bureau Seeks Comment on Petition for Rulemaking Regarding Location and Monitoring Service Rules, *Public Notice*, RM 10403, DA 02-817 (rel. Apr. 10, 2002).

band ITS-focused network called the National Infrastructure Radio Service (NIRS)³⁵³ involves issues best addressed in a separate proceeding.³⁵⁴

IV. PROCEDURAL MATTERS

A. Initial Regulatory Flexibility Analysis

85. The Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on small entities of the policies and rules proposed in the Notice of Proposed Rulemaking; it is contained in Appendix A. We request written public comment on the analysis. Comments must be filed in accordance with the same filing deadlines as comments filed in response to the Notice of Proposed Rulemaking, and must have a separate and distinct heading designating them as responses to the IRFA. The Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, will send a copy of this Notice of Proposed Rulemaking, including the IRFA, to the Chief Counsel for Advocacy of the Small Business Administration.

B. Paperwork Reduction Analysis

86. This Notice contains either a proposed or modified information collection. As part of its continuing effort to reduce paperwork burdens, we invite the general public and the Office of Management and Budget (OMB) to take this opportunity to comment on the information collections contained in this Notice, as required by the Paperwork Reduction Act of 1995, Public Law 104-13. Public and agency comments are due at the same time as other comments on this Notice; OMB comments are due 60 days from date of publication of this Notice in the Federal Register. Comments should address: (a) whether the proposed collection of information is necessary for the proper performance of the functions of the Commission, including whether the information shall have practical utility; (b) the accuracy of the Commission's burden estimates; (c) ways to enhance the quality, utility, and clarity of the information collected; and (d) ways to minimize the burden of the collection of information on the respondents, including the use of automated collection techniques or other forms of information technology.

87. Written comments by the public on the proposed and/or modified information collections are due 60 days after the date of publication in the Federal Register. Written comments must be submitted by the Office of Management and Budget (OMB) on the proposed and/or modified information collections on or before 60 days after the date of publication in the Federal Register. In addition to filing comments with the Secretary, a copy of any comments on the information collection(s) contained herein should be submitted to Judy Boley Herman, Federal Communications Commission, Room 1-C804, 445 12th Street, SW, Washington, DC 20554, or via the Internet to jbHerman@fcc.gov and to Jeanette Thornton, OMB Desk Officer, Room 10236 NEOB, 725 17th Street, N.W., Washington, DC 20503 or via the Internet to jthornto@mb.eop.gov.

C. Ex Parte Presentations

88. For purposes of this permit-but-disclose notice and comment rulemaking proceeding, members of the public are advised that *ex parte* presentations are permitted, except during the Sunshine Agenda period, provided they are disclosed under the Commission's rules.³⁵⁵

³⁵³ Warren C. Havens and Telesaurus Holdings GB, LLC Comments at 4-5.

³⁵⁴ See, e.g., *supra* n. 352.

D. Comment Dates

89. Pursuant to Sections 1.415 and 1.419 of the Commission's rules, 47 C.F.R. §§ 1.415, 1.419, interested parties may file comments on or before **[60 days from publication in the Federal Register]**, and reply comments on or before **[90 days from publication in the Federal Register]**. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS) or by filing paper copies. *See Electronic Filing of Documents in Rulemaking Proceedings*, 63 Fed. Reg. 24121 (1998).

90. Comments filed through the ECFS can be sent as an electronic file via the Internet to <<http://www.fcc.gov/e-file/ecfs.html>>. Generally, only one copy of an electronic submission must be filed. If multiple docket or rulemaking numbers appear in the caption of this proceeding, *i.e.* WT Docket 01-90, however, commenters must transmit one electronic copy of the comments to each docket or rulemaking number referenced in the caption. In completing the transmittal screen, commenters should include their full name, U.S. Postal Service mailing address, and the applicable docket or rulemaking number. Parties may also submit an electronic comment by Internet e-mail. To get filing instructions for e-mail comments, commenters should send an e-mail to ecfs@fcc.gov, and should include the following words in the body of the message, "get form <your e-mail address>." A sample form and directions will be sent in reply. Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, commenters must submit two additional copies for each additional docket or rulemaking number. Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail (although we continue to experience delays in receiving U.S. Postal Service mail). The Commission's contractor, Vistrionix, Inc., will receive hand-delivered or messenger-delivered paper filings for the Commission's Secretary at 236 Massachusetts Avenue, N.E., Suite 110, Washington, D.C. 20002. The filing hours at this location are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building. Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743. U.S. Postal Service first-class mail, Express Mail, and Priority Mail should be addressed to 445 12th Street, SW, Washington, D.C. 20554. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

E. Further Information

91. For further information concerning the Notice of Proposed Rulemaking, contact Nancy M. Zaczek at (202) 418-7590, Gerardo Mejia at (202) 418-2895 or via e-mail at nzaczek@fcc.gov or gmejia@fcc.gov, or via TTY (202) 418-7233, Wireless Telecommunications Bureau, Federal Communications Commission, Washington, D.C. 20554.

92. Alternative formats (computer diskette, large print, audio cassette, and Braille) are available to persons with disabilities by contacting Brian Millin at (202) 418-7426, TTY (202) 418-7365, or via e-mail to bmillin@fcc.gov. This Notice of proposed Rulemaking can be downloaded at <http://www.fcc.gov/Wireless/Orders/2002/fcc0215txt>.

V. ORDERING CLAUSES

93. ACCORDINGLY, IT IS ORDERED that, pursuant to Sections 1, 4(i), 302, 303(f) and (r), and 332 of the Communications Act of 1934, as amended, 47 U.S.C. 1, 154(i), 302, 303(f) and (r), and

(Continued from previous page) _____
³⁵⁵ See generally 47 C.F.R. §§ 1.1202, 1.1203, 1.1206(a).

332, NOTICE IS HEREBY GIVEN of the proposed regulatory changes described in this NOTICE OF PROPOSED RULEMAKING AND ORDER, and that COMMENT IS SOUGHT on these proposals.

94. IT IS FURTHER ORDERED that the Petitions for Reconsideration or Clarification of the *Allocation Report and Order*, ET Docket No. 98-95, filed by PanAmSat Corporation and Mark IV Industries Limited, I.V.H.S. Division ARE DISMISSED AS MOOT.

95. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this NOTICE OF PROPOSED RULEMAKING AND ORDER, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the U.S. Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A -- INITIAL REGULATORY FLEXIBILITY ANALYSIS

(for *Notice of Proposed Rulemaking*)

As required by the Regulatory Flexibility Act ("RFA"),³⁵⁶ the Commission has prepared this present Initial Regulatory Flexibility Analysis ("IRFA") of the possible significant economic impact on small entities by the policies and rules proposed in the Notice of Proposed Rulemaking (*Notice*), WT Docket No. 01-90. Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments on the *Notice* as provided above. The Commission will send a copy of the *Notice*, including the IRFA, to the Chief Counsel for Advocacy of the U.S. Small Business Administration.³⁵⁷ In addition, the *Notice* and IRFA (or summaries thereof) will be published in the Federal Register.³⁵⁸

Need for, and Objectives of, the Proposed Rules

In this *Notice*, we propose licensing, service, and operating rules for the 5.850-5.925 GHz band for use by Dedicated Short Range Communications (DSRC) Services in the provision of Intelligent Transportation Systems (ITS) services. DSRC communications are used for the non-voice wireless transfer of data over short distances between roadside and mobile units, between mobile units, and between portable and mobile units to perform operations related to the improvement of traffic flow, traffic safety, and other intelligent transportation service applications in a variety of environments. This action is taken as a follow-up to the *Allocation Report and Order*, in which the Commission stated that it would defer licensing and service rules to a later proceeding.³⁵⁹

Legal Basis for Proposed Rules

The proposed action is authorized under Sections 1, 4(i), 302, 303(f) and (r), and 332 of the Communications Act of 1934, as amended, 47 U.S.C. 1, 154(i), 302, 303(f) and (r), and 332.

Description and Estimate of the Number of Small Entities To Which the Proposed Rules Will Apply

The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted.³⁶⁰ The RFA defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."³⁶¹ In addition, the term "small business" has the same meaning as

³⁵⁶ See 5 U.S.C. § 603. The RFA, *see* 5 U.S.C. §§ 601 *et. seq.*, has been amended by the Contract with America Advancement Act of 1996, Pub. L. No. 104-121, 110 Stat. 847 (1996) (CWAA). Title II of the CWAA is the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA).

³⁵⁷ 5 U.S.C. § 603(a).

³⁵⁸ *See id.*

³⁵⁹ Amendment of Parts 2 and 90 of the Commission's Rules to Allocate 5.850-5.925 GHz to the Mobile Service for Dedicated Short Range Communications of Intelligent Transportation Services, ET Docket 98-95, *Report and Order*, 14 FCC Rcd 18221 ¶ 1 (1999) (*Allocation Report and Order*).

³⁶⁰ 5 U.S.C. § 603(b)(3).

³⁶¹ 5 U.S.C. § 601(6).

the term "small business concern" under the Small Business Act.³⁶² A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).³⁶³ A small organization is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."³⁶⁴ Nationwide, as of 1992, there were approximately 275,801 small organizations.³⁶⁵ "Small governmental jurisdiction"³⁶⁶ generally means "governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than 50,000."³⁶⁷ As of 1992, there were approximately 85,006 governmental entities in the United States.³⁶⁸ This number includes 38,978 counties, cities, and towns; of these, 37,566, or 96%, have populations of fewer than 50,000.³⁶⁹ The Census Bureau estimates that this ratio is approximately accurate for all governmental entities. Thus, of the 85,006 governmental entities, we estimate that 81,600 (96%) are small entities.

With respect to the 5.9 GHz band, the Commission has not yet determined how many licenses will be awarded. Moreover, the Commission does not yet know how many applicants or licensees will be small entities. We therefore assume that, for purposes of our evaluations and conclusions in the IRFA, all prospective licensees are small entities, as that term is defined by the SBA or by our proposed small business definitions for these bands. We invite comment on this analysis.

In addition, we note that the SBA has developed size standards for wireless small businesses within the two separate Economic Census categories of Paging and of Cellular and Other Wireless Telecommunications. For both of those categories, the SBA considers a business to be small if it has 1,500 or fewer employees. 13 C.F.R. §§ 121.201, NAICS codes 517211, 517212. According to the Commission's most recent *Telephone Trends Report* data,³⁷⁰ 1,761 companies reported that they were engaged in the provision of wireless service. *Telephone Trends Report*, Table 5.3. Of these 1,761

³⁶² 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in 15 U.S.C. 632). Pursuant to the RFA, the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register." 5 U.S.C. § 601(3).

³⁶³ Small Business Act, 15 U.S.C. § 632 (1996).

³⁶⁴ 5 U.S.C. § 601(4).

³⁶⁵ 1992 Economic Census, U.S. Bureau of the Census, Table 6 (special tabulation of data under contract to Office of Advocacy of the U.S. Small Business Administration).

³⁶⁶ 47 C.F.R. § 1.1162.

³⁶⁷ 5 U.S.C. § 601(5).

³⁶⁸ U.S. Dept. of Commerce, Bureau of the Census, "1992 Census of Governments."

³⁶⁹ *Id.*

³⁷⁰ FCC, Wireline Competition Bureau, Industry Analysis and Technology Division, "Trends in Telephone Service" at Table 5.3, page 5-5 (May 2002) (FCC Website location (*see* online page 34): <http://www.fcc.gov/Bureaus/Common Carrier/Reports/FCC-State link/IAD/trend502.pdf>).

companies, an estimated 1,175 have 1,500 or fewer employees and 586 have more than 1,500 employees. *Id.* Consequently, the Commission estimates that most wireless service providers are small entities.

The Commission has not developed a definition of small entities specifically applicable to Dedicated Short-Range Communications Manufacturers (DSRC Manufacturers). However, the SBA has established a small business size standard for Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing. Under this standard, firms are considered small if they have 750 or fewer employees.³⁷¹ Census data for 1997 indicate that, for that year, there were a total of 1,215 establishments³⁷² in this category.³⁷³ Of those, there were 1150 that had employment under 500, and an additional 37 that had employment of 500 to 999. The percentage of wireless equipment manufacturers to total manufacturers in this category is approximately 61.35%,³⁷⁴ so we estimate that the number of wireless equipment manufacturers with employment under 500 was actually closer to 706, with an additional 23 establishments having employment of between 500 and 999. Given the above, we estimate that the great majority of wireless communications equipment manufacturers are small.

Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements

In the *Notice*, we seek comment on whether to designate a portion of the band for public safety and non-public safety radio. Should we decide to license a portion of the 5.9 GHz band for public safety purposes, those licensees will be required to submit an application through the Universal Licensing System using Form 601.³⁷⁵ Other possible requirements include complying with Part 90 of the Commission's Rules and Part 15 of our Rules if unlicensed operations are permitted.

Should we adopt a licensing scheme that results in mutually exclusive applications, applicants for licenses will be required to submit short-form auction applications using FCC Form 175.³⁷⁶ In addition, winning bidders must submit long-form license applications through the Universal Licensing System using FCC Form 601,³⁷⁷ and other appropriate forms.³⁷⁸ Licensees will also be required to

³⁷¹ 13 C.F.R. § 121.201, NAICS code 334220.

³⁷² The number of "establishments" is a less helpful indicator of small business prevalence in this context than would be the number of "firms" or "companies," because the latter take into account the concept of common ownership or control. Any single physical location for an entity is an establishment, even though that location may be owned by a different establishment. Thus, the numbers given may reflect inflated numbers of businesses in this category, including the numbers of small businesses. In this category, the census breaks-out data for firms or companies only to give the total number of such entities for 1997, which was 1,089.

³⁷³ U.S. Census Bureau, 1997 Economic Census, Industry Series: Manufacturing, "Industry Statistics by Employment Size," Table 4, NAICS code 334220 (issued Aug. 1999).

³⁷⁴ *Id.* Table 5, "Industry Statistics by Industry and Primary Product Class Specialization: 1997."

³⁷⁵ See 47 C.F.R. § 1.913(a)(1).

³⁷⁶ See 47 C.F.R. § 1.2105.

³⁷⁷ See 47 C.F.R. § 1.913(a)(1).

apply for an individual station license by filing FCC Form 601 for those individual stations that (1) require submission of an Environmental Assessment under Section 1.1307 of our Rules;³⁷⁹ (2) require international coordination;³⁸⁰ (3) would operate in the quiet zones listed in Section 1.924 of our Rules;³⁸¹ or (4) require coordination with the Frequency Assignment Subcommittee (FAS) of the Interdepartment Radio Advisory Committee (IRAC).³⁸² Licensees will be required to identify on Form 601 the type of service or services they intend to provide. We comment of how these filing requirements can be modified to reduce the burden on small entities.

Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives: (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.³⁸³

We have reduced the burdens wherever possible. To minimize any negative impact, however, we propose certain incentives for small entities that will redound to their benefit. We propose the use of bidding credits for small entities that participate in auctions of licenses that are conducted pursuant to the rules proposed in this *Notice*. We propose to define a “small business” as an entity with average annual gross revenues for the preceding three years not to exceed \$15 million and a “very small business” as an entity with average gross revenues for the preceding three years not to exceed \$3 million.³⁸⁴ We believe that these bidding credits will help small entities compete in our auctions and acquire licenses. We seek comment on our proposed small business definitions and bidding credits, including information on factors that may affect the capital requirements of the type of services a licensee may seek to provide.

The regulatory burdens we have retained, such as filing applications on appropriate forms, are necessary in order to ensure that the public receives the benefits of innovative new services in a prompt and efficient manner. We will continue to examine alternatives in the future with the objectives of eliminating unnecessary regulations and minimizing any significant economic impact on small entities. We seek comment on significant alternatives commenters believe we should adopt.

(Continued from previous page) _____

³⁷⁸ See 47 C.F.R. § 1.2107.

³⁷⁹ 47 C.F.R. § 1.1307.

³⁸⁰ See, e.g., 47 C.F.R. § 1.928 (regarding frequency coordination arrangements between the U.S. and Canada).

³⁸¹ 47 C.F.R. 1.924.

³⁸² FAS coordination is required for DSRCS stations within 75 kilometers of certain government radar locations listed in 47 C.F.R. § 90.371(b).

³⁸³ See 5 U.S.C. § 603(c).

³⁸⁴ See *infra* para. 79.

Federal Rules that May Duplicate, Overlap, or Conflict With the Proposed Rules

None.

APPENDIX B—LIST OF DSRC-BASED ITS APPLICATIONS³⁸⁵**PROPOSED PUBLIC SAFETY**

1. Probe Data Collection
2. Traffic Information
3. Toll Collection
4. In-Vehicle Signing
 - a. Work Zone Warning
 - b. Highway/Rail Intersection Warning
 - c. Road Condition Warning
5. Intersection Collision Avoidance
6. Vehicle to Vehicle
 - a. Vehicle Stopped or Slowing Warning
 - b. Vehicle-Vehicle Collision Avoidance
 - c. Imminent Collision Warning
7. Rollover Warning
8. Low Bridge Warning
9. Mainline Screening
10. Border Clearance
11. On-Board Safety Data Transfer
12. Commercial Vehicle Operations (CVO) Driver's Daily Log
13. Vehicle Safety Inspection
14. Transit Vehicle Data Transfer (gate and yard)
15. Transit Vehicle Signal Priority
16. Emergency Vehicle Signal Preemption
17. Emergency Vehicle Video Relay

³⁸⁵ As proposed by ITS America. *See* Second Proposed Band Plan at 3. *See also* July Ex Parte Comments at 24.

18. Emergency Vehicle Approach Warning
19. Transit Vehicle Refueling

PROPOSED NON-PUBLIC SAFETY

1. Access Control
2. Gas Payment
3. Drive-Thru Payment
4. Parking Lot Payment
5. Data Transfer (IDB, J1708, J1939, PCI, etc)
 - a. Advanced Traveler Information Systems (ATIS) Data
 - b. Vehicle Diagnostic Data
 - c. Repair-Service Record
 - d. Vehicle Computer Program Updates
 - e. Map and Music Data Updates
6. Rental Car Processing
7. Unique CVO Fleet Management
8. CVO Truck Stop Data Transfer
9. Locomotive Fuel Monitoring
10. Locomotive Data Transfer

APPENDIX C – LIST OF COMMENTERS

The following documents were filed in response to the *Public Notice*: Wireless Telecommunications Bureau Seeks Comment Regarding Intelligent Transportation System Applications Using Dedicated Short-Range Communications, WT Docket 01-90, *Public Notice*, 16 FCC Rcd 8824 (2001).

LIST OF PARTIES RESPONDING TO PUBLIC NOTICE**Comments**

Federal Signal Corporation

Intelligent Transportation Society of America

International Bridge, Tunnel and Turnpike Association

Mark IV Industries, Limited, I.V.H.S. Division

Motorola

Public Safety Wireless Network

TransCore Corporation

Warren Havens and Telesaurus Holdings GB, LLC

Reply Comments

American Association of State Highway and Transportation Officials

Federal Signal Corporation

Intelligent Transportation Society of America

Public Safety Wireless Network