

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 DC 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 thereon)."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 *LIDS 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."''''

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-band³⁰⁷

In response to the *Allocation Report and Order*, Mark IV Industries requested that we clarify the power limits and emission mask requirements³⁰⁸. 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. 1 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 100kHz 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 "100kHz" 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.”

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 10ppm 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 I 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. 5962.

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 *Compennve 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.” The *Parr I 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 5.9GHz 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.”

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 *Parr I 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 I 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 I Third Report and Order* 13 FCC Rcd at 40344 ¶ 47. See also 47 C.F.R. § 1.2110(f)(2)

³⁴⁷ *Parr I 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** proceeding³⁵⁴

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 **sepa-ate** 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 papenvork 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 jbHermanG,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-butdisclose 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."

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. §§ 1415, 1419, 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/fcc0215.txt>.

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).

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. 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 WA, 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 Regulator 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. Of those, there were 1,150 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%.³⁷³ 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 5.9GHz 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;” (2) require international coordination;³⁸⁰ (3) would operate in the quiet zones listed in Section 1.924 of our Rules;” 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 on 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 17 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. 1.921.

³⁸² FAS coordination is required for DSRCS stations within 75 kilometers of certain government radar locations listed in 17 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 APPLICATIONS³⁸⁵PROPOSED 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