

BEFORE THE
Federal Communications Commission
Washington, D.C. 20554

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

To: The Commission

**REPLY COMMENTS OF THE
SATELLITE INDUSTRY ASSOCIATION**

The Satellite Industry Association (“SIA”) submits the following reply comments in the above-captioned proceeding concerning service rules for Dedicated Short Range Communications (“DSRC”) stations in the Intelligent Transportation System Radio Service operating in the 5.850-5.925 GHz band (“5.9 GHz band”).¹ SIA is a U.S.-based trade association representing the leading U.S. and international satellite manufacturers, service providers, and launch service companies. SIA serves as an advocate for the commercial satellite industry on regulatory and policy issues common to its members. With its member companies providing a

¹ *Amendment of the Commission’s Rules Regarding Dedicated Short-Range Communication Services in the 5.850-5.925 GHz Band (5.9 GHz Band), Amendment of Parts 2 and 90 of the Commission’s Rule to Allocate the 5.850-5.925 GHz Band to the Mobile Service for Dedicated Short Range Communications of Intelligent Transportation Services, NPRM & Order, WT Docket No. 01-90 ET Docket, No. 98-95, RM-9096 (“Notice”).*

broad range of manufactured products and services, SIA represents the unified voice of the commercial satellite industry.²

As discussed below, SIA believes that it is essential for DSRC service rules to take into account the co-primary uplink operations of existing and future extended C-band Fixed-Satellite Service (“FSS”) earth stations in the 5.9 GHz band, as well as those of conventional C-band FSS earth stations in the adjacent 5925-6425 MHz band. Specifically, the Commission should adopt DSRC service rules that take into account the existing “noise floor” from FSS earth station uplinks operating co-frequency in the 5.9 GHz band and out-of-band emissions from FSS earth station uplinks in the 5925-6425 MHz band. In addition, to the extent that co-frequency FSS uplink transmissions in the 5.9 GHz band cannot be fully taken into account in establishing an applicable “noise floor,” the Commission should adopt protection and coordination provisions similar to those of Section 90.371(b) governing DSRC sharing with government radiolocation stations. SIA believes, however, that additional study is required to address these issues, and seeks to supplement the record of this proceeding after consultation with DSRC proponents.

I. BACKGROUND

SIA’s members have a strong interest in this proceeding. The 5.9 GHz band comprises part of what is known as the “extended C-band,” which has long been allocated to the FSS on a primary basis.³ The 5.9 GHz band is currently used by SIA members for uplinks for

² SIA Executive Members include The Boeing Company; Globalstar, L.P.; Hughes Network Systems, Inc.; ICO Global Communications; Intelsat; Lockheed Martin Corp.; Loral Space & Communications Ltd.; Mobile Satellite Ventures; Northrop Grumman Corporation; PanAmSat Corporation; SES Americom, Inc.; and Associate Members include Inmarsat Ventures PLC and New Skies Satellites Inc.

³ Unlike the 3650-3700 MHz portion of extended C-band spectrum, in which the Commission “grandfathered” the primary downlink operations of existing earth stations and now licenses new earth station downlinks on a secondary basis only, the 5.850-5.925 GHz extended C-band uplink

intercontinental FSS services, and is adjacent to the heavily used conventional C-band FSS uplink spectrum at 5925-6425 MHz. C-band and extended C-band spectrum constitute one of two principal frequency bands used by the global FSS industry. The FSS space station and earth station facilities using these frequencies represent billions of dollars in sunken investment and play a critical role in the global information infrastructure, from carrying international telecommunications traffic to transmitting video programming to cable head-ends in the United States. As a result, it is imperative for the Commission to develop DSRC service rules that protect the viability of existing and future co-primary C-band and extended C-band FSS services.

A. The DSRC Spectrum Allocation Proceeding

In the initial proceeding allocating spectrum to DSRC services, the United States Department of Transportation (“DOT”) suggested that an allocation of seventy-five megahertz of spectrum was necessary for DSRC operations because two incumbents -- high power military radar systems and FSS uplinks -- potentially could interfere with DSRC operations.⁴ Indeed, DOT indicated that FSS uplinks “suggest a potential interference range of several hundred miles.”⁵ In allocating the 5.9 GHz band for DSRC operations, however, the Commission 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

spectrum remains allocated to FSS on a primary basis. *See Amendment of the Commission’s Rules with Regard to the 3650-3700 MHz Government Transfer Band*, First Report and Order and Second Notice of Proposed Rule Making, 15 FCC Rcd 20488 (2000).

⁴ U.S. Department of Transportation Comments, ET Docket 98-95, at 2.

⁵ *Id.*

power.⁶ 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.⁷ 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, and that it did not anticipate that prior coordination would be necessary between DSRC and FSS operations.⁸

In a Petition for Reconsideration or Clarification of the Commission's allocation decision, PanAmSat Corporation raised concerns about the potential impact of DSRC operations on co-primary, co-frequency FSS earth station uplink operations in the 5.9 GHz band absent a coordination procedure or other rules designed to facilitate existing and future FSS operations:

. . . 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 . . . 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.⁹

SIA filed in support PanAmSat's petition, stating:

. . . 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

⁶ *Amendment of Parts 2 and 90 of the Commission's Rule to Allocate the 5.850-5.925 GHz Band to the Mobile Service for Dedicated Short Range Communications of Intelligent Transportation Services*, Report and Order, ET Docket No. 98-95, 14 FCC Rcd 18221 (1999) at ¶15.

⁷ *Id.*

⁸ *Id.*

⁹ PanAmSat Corporation, Petition for Reconsideration or Clarification, ET Docket No. 98-95 (filed Dec. 27, 1999) at 2.

deployment of DSRC stations, but it also could lead to band sharing disputes when FSS earth station operators expand or modify their facilities.¹⁰

PanAmSat's petition was dismissed as moot because the Commission sought comment on the issues raised therein for consideration in this proceeding.

B. The Current DSRC Service Rules Proceeding

In the *Notice*, recognized the concerns of PanAmSat and SIA. Specifically, the Commission agreed with PanAmSat that widespread deployment of DSRC terminals could limit where new FSS earth stations can be located, and sought comment on whether prior coordination would be necessary and, if so, under what conditions.¹¹ In particular, the Commission asked whether "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)" and, if some type of prior coordination is necessary or appropriate, how to accomplish such coordination with minimal burden and cost considering the mobile nature of the DSRC service.¹² The Commission also requested comment on whether DSRC equipment and operations should take into account the "noise floor" that is present from FSS uplink transmissions, and whether FSS uplink transmissions in the 5.9 GHz band would interfere with the DSRC operations.¹³

The "noise floor" concept is also related to the separate issue of out-of-band emissions from FSS earth stations operating in the adjacent conventional C-band uplink frequencies (5925-6425 MHz). PanAmSat raised this issue in its initial comments in this proceeding, and urged the

¹⁰ Comments of the Satellite Industry Association, ET Docket No. 98-95 (filed Mar. 2, 2000) at 2.

¹¹ See *Notice* at ¶57.

¹² *Id.*

¹³ *Id.*

Commission to adopt DSRC service rules that take into account the existing noise floor from out-of-band emissions from adjacent-band FSS operations.¹⁴ PanAmSat argued that adopting these protections before DSRC systems are deployed will ensure that such systems can be used for their intended purposes, including public safety purposes, and will protect the satellite industry's multi-billion dollar investment in C-band infrastructure.¹⁵ SIA files these reply comments to underscore the out-of-band emissions issues raised by PanAmSat, and to highlight again the issues relating to potential in-band interference from co-primary extended C-band FSS uplinks in the 5.9 GHz band.

II. THE DSRC SERVICE RULES MUST ENSURE THE VIABILITY OF EXISTING AND FUTURE CO-PRIMARY FSS OPERATIONS

SIA shares the fundamental concern identified by the Commission in the *Notice* with respect to DSRC sharing with co-primary FSS operations: the widespread deployment of DSRC stations could limit where new FSS earth stations can be located. As a co-primary service, DSRC stations generally would be entitled to protection from harmful interference caused by subsequently authorized FSS earth stations. The concern regarding possibility of creating numerous exclusion zones or otherwise limiting co-primary FSS operations is heightened by the potential public safety applications envisioned for DSRC stations.

Nevertheless, as indicated in the *Notice*, the operational characteristics of FSS uplink transmissions (*e.g.*, the use of highly directional antennas pointed at the geostationary arc) may ameliorate such interference concerns. As a result, SIA believes that it may be possible to establish service rules that would avoid the need for prior coordination and protect the

¹⁴ Comments of PanAmSat Corporation, WT Docket No. 01-90, ET Docket No. 98-95, RM-9096 (filed Mar. 17, 2003).

¹⁵ *Id.*

operational and deployment flexibility of existing and future FSS earth stations and DSRC stations. To the extent that a potential for harmful interference remains, however, the Commission should confirm that new DSRC stations will not be entitled to protection from FSS uplink operations at existing teleport sites, and establish a coordination procedure similar to that governing sharing between DSRC stations and government radiolocation stations.

A. The Commission Should Adopt DSRC Service Rules that Take Into Account the “Noise Floor” from Uplink Transmissions of Conventional C-Band and Extended C-Band FSS Earth Stations

SIA fully agrees with PanAmSat that the Commission should adopt service rules for DSRC stations in the 5.9 GHz band that take into account the existing “noise floor” from co-primary FSS uplinks, including those in the adjacent conventional C-band (5925-6425 MHz) and, to the maximum extent possible, co-frequency operations in the extended C-band (5.9 GHz band). With respect to out-of-band emissions from adjacent conventional C-band earth stations, as indicated by PanAmSat, the Commission’s FSS earth station operational rules (including Sections 25.202(f), 25.209, 25.211 and 25.212), combined with the minimum permissible earth station elevation angle,¹⁶ essentially establish a “noise floor” within which DSRC stations would be required to operate. By designing DSRC stations to operate in this interference environment, co-primary DSRC stations would be able to provide service within the current operational environment in the 5.9 GHz band.

Furthermore, by establishing a “noise floor” that also takes into account co-frequency FSS uplink transmissions of extended C-band earth stations, DSRC stations would be able to

¹⁶ The Commission must consider the minimum earth station angle of five degrees in establishing the applicable noise floor because FSS earth stations typically are licensed to communicate with a number of satellites in various orbital locations along the geostationary arc, and because satellite relocations and the deployment of new satellites may require FSS earth stations to operate at the lowest permissible elevation angles.

operate without the need for any prior coordination. SIA recognizes, however, that it may not be possible to establish a “noise floor” that takes into account co-frequency FSS uplink transmissions of an extended C-band earth station operating at maximum power and a five-degree elevation angle where the victim DSRC station is located in close proximity and within the earth station’s boresight.¹⁷ These uplink transmissions are high-power signals and, even though extended C-band FSS earth stations utilize highly directional antennas, the co-frequency transmissions could potentially cause interference into DSRC receive antennas. Accordingly, if co-frequency FSS uplink transmissions cannot be fully taken into account in establishing an applicable “noise floor” for DSRC operations, the Commission should adopt rules protecting these co-primary FSS operations at existing teleport sites and establishing a prior coordination requirement for new DSRC stations seeking to operate in their vicinity.

B. The Commission Should Adopt Protection and Coordination Provisions for Co-Frequency FSS Operations Similar to that Adopted for Government Radiolocation Services

In the *Notice*, the Commission sought comment on whether prior coordination between DSRC stations and FSS earth stations would be necessary and, if so, under what conditions. For example, the Commission asked whether “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).”¹⁸ SIA believes that prior coordination of may be necessary in certain circumstances for

¹⁷ It should be possible, however, to take into account emission levels from antenna sidelobes/backlobes of co-frequency FSS uplink transmissions in developing an appropriate “noise floor” for DSRC operations.

¹⁸ See Notice at ¶57. SIA assumes that the Commission’s prior coordination inquiry refers only to new FSS earth stations transmitting in the 5.9 GHz band. Adoption of DSRC service rules that take into account the existing “noise floor” from FSS uplink transmissions should avoid any need for prior coordination with FSS earth stations operating in conventional C-band frequencies.

new DSRC stations seeking to operate in the vicinity of FSS earth station facilities, and for new FSS earth stations seeking to operate at locations other than existing teleports sites. Accordingly, SIA believes the Commission should establish protection and coordination provisions modeled after the existing rule governing sharing between DSRC stations and government radiolocation stations.

In the original allocation decision, the Commission concluded that sharing between DSRC operations and Government operations was possible if proper coordination was performed. Accordingly, the Commission adopted new Section 90.371(b), which provides that DSRC stations in the 5.9 GHz band “shall not receive protection from Government Radiolocation services in operation prior to the establishment of the DSRC station.” Section 90.371(b) further requires that “[o]peration of DSRC stations within 75 kilometers of the location listed” in the table accompanying the rule must be coordinated through NTIA.

SIA believes that the Commission should adopt a similar approach to sharing between new DSRC stations and co-primary extended C-band FSS earth stations operating in the 5.9 GHz band. For example, although the *Notice* suggests that new DSRC stations would not be entitled to protection from FSS uplink operations at existing teleport sites, SIA believes that the Commission should make this clear by adopting a rule similar to that addressing sharing between DSRC stations and government radiolocation stations.¹⁹ Thus, as with preexisting government radiolocation stations, DSRC stations should not receive protection from FSS earth stations located at teleport sites in operation prior to the establishment of the DSRC station.

Similarly, new DSRC stations seeking to operate in the vicinity of FSS earth station teleport sites, and new FSS earth stations seeking to operate at locations other than existing

¹⁹ See *Notice* at ¶57; see also 47 C.F.R. §90.371(b).

teleports sites, should be required to coordinate their operations prior to the commencement of service if there is a potential for harmful interference. The parameters of an appropriate “coordination zone” depends on a number of factors, some of which are not yet known. For example, the level of the “noise floor” established by the Commission for DSRC operations (representing a “built-in” interference tolerance) will affect the required coordination distance. In addition, the operational characteristics of DSRC equipment (both road side and on board units) will affect the coordination distance. Thus, it is difficult for SIA to outline fully necessary coordination rules at this time.

In general, however, SIA believes that it should be possible to identify a “coordination zone” around existing FSS teleport facility outside of which no coordination would be necessary. Rather than a defined radius around an existing FSS teleport facility, an appropriate coordination zone in the DSRC/FSS context essentially would be a southward-facing arc defined by the azimuths associated with minimum earth station elevation angles in the easterly and westerly directions (to permit communications with satellites located anywhere in the visible geostationary arc). Of course, the coordination zone would merely identify the geographic region where there is a need coordinate; DSRC operations could be deployed within the coordination zone depending on the particulars of each case and the DSRC operator’s ability to tolerate potential interference, if any, from co-frequency FSS transmissions.²⁰ However, the burden would be on the subsequent DSRC station to coordinate its operations with the existing earth station teleport.

²⁰ Considerations affecting the ability of DSRC systems to operate successfully include distance, the orientation of road side and on board units relative to the FSS earth station, terrain blockage and other factors.

In the case of a new earth station not located at an existing teleport facility, a similar approach would be followed. The coordination zone associated with the proposed earth station site would be examined to determine if any DSRC road side stations are located within the zone. If so, the interference scenario with respect to each DSRC road side station and associated on board stations would be examined and coordinated. In many cases, terrain blockage and other factors may resolve the potential interference case. In addition, the FSS earth station operator could eliminate a potential interference case by limiting the azimuths and elevations angles at which the earth station will operate. However, the burden would be on the subsequent earth station to coordinate its operations with the pre-existing DSRC station.

Given the mobile nature of the DSRC service, there also is the possibility of DSRC on board stations communicating with each other anywhere in the United States, including within the coordination zone of an FSS earth station facility. In such circumstances, prior coordination would not be possible. SIA assumes that the DSRC on board stations will be in such proximity that reliable communications can take place. Indeed, such circumstances would exist even in the absence of a coordination requirement for DSRC operations, and thus should not be a factor in developing such a requirement.

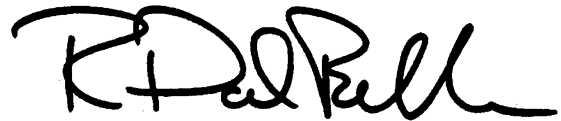
III. CONCLUSION

SIA urges the Commission to adopt DSRC service rules that take into account the co-primary uplink operations of extended C-band FSS earth stations in the 5.9 GHz band, and out-of-band emissions from conventional C-band FSS earth stations. SIA believes that additional consultation between the satellite industry and DSRC proponents is necessary to fully examine the issues associated with developing an appropriate “noise floor” for DSRC operations and, to the extent necessary, establishing protection and coordination provisions for co-frequency FSS

uplink operations. SIA looks forward to working with DSRC proponents to address these issues and will supplement the record of this proceeding at the earliest possible time to facilitate the introduction and reliable operation of DSRC systems, and to ensure the successful operation of existing and future FSS earth stations.

Respectfully submitted,

Satellite Industry Association

A handwritten signature in black ink, appearing to read "R DalBello". The signature is stylized with a large initial "R" and a cursive "DalBello".

By: _____
Richard DalBello
President
255 Reinekers Lane
Suite 600
Alexandria, VA 22314
(703) 549-8697

April 15, 2003