

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

To: The Commission

COMMENTS OF SIEMENS TRANSPORTATION SYSTEM

Siemens Transportation Systems ("STS") hereby submits these comments in support of the Commission's proposed rules to govern the licensing and use of Dedicated Short-Range Communications ("DSRC") services in the 5.850-5.925 GHz band ("5.9 GHz band"). As currently defined the DSRC service permits the use of non-voice radio techniques to transfer data over short distances between roadside and mobile radio 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 public and commercial environments. DSRC systems may also transmit status and instructional messages related to the units involved.

In the Notice of Proposed Rulemaking and Order, the Commission proposed, "to permit entities providing public safety DSRC operations to use the 5.9 GHz band" and for public safety entities the Commission

proposed " to apply the application, licensing and processing rules under Part 90 of the Commission's Rules." ¹

In support of the above proposals, the Commission sought comment on numerous issues including the following:

- 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;
- 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; and
- various technical matters.²

STS supports the Commission's proposals and offers comments on those issues that the Commission identified and sought comment on as well as issues not specifically identified above.

STC is a leading manufacturer of commercial telecommand and data telemetry control systems for applications demanding highly reliable communications systems for use in vehicular control applications. STS is currently deploying communications and control systems for use in public safety related applications having a range of 50 to 3000 feet that consist of carborne or

¹ Amendment of the Commission's Rules Regarding Dedicated Short-Range Communication Services in the 5.850 to 5.925 GHz band (5.9 GHz band), WT Docket 01-90, *Notice of Proposed Rulemaking and Order*, FCC 03-302 (rel. November 15, 2002), at 1

onboard units (OBU's) and wayside or roadside units (RSU's) for use in metropolitan transit systems (trains). In the aftermath of September 11, 2001 and Homeland Security issues, systems such as the one provided by STS will play a very prominent role in the area of public safety related to mass transit applications. Instead of the traditional method of setting routes within an interlocking area grid controlled by wiring and switches with manual vehicle control, the STS system provides control and management where each vehicle or train's movement and its precise location, intended destination and speed is directly associated with each vehicle within the transit system through a centralized control system. Thus, this system can automatically regulate any train, optimizing operation and provide easy resolution of multiple train conflicts and further, during an incident, whether it is an imminent threat or during disaster recovery, this capability allows an urban transit organization to immediately divert passengers away from the affected area directly providing greatly improved safety of the public passengers.

I. Eligibility and Licensing Issues

A. Eligibility

The Commission previously allocated the 5.9 GHz band and established the DSRC service in Part 90 of its rules. In the instant proceeding the Commission will determine the entities, both public and private, that are eligible to use the band and, in the case of public safety entities, the Commission proposes to apply the procedures for application, licensing, and processing rules in Part 90 to these entities. STS urges the Commission to ensure that metropolitan transit systems will be eligible for licenses for mass transit communications and

(...Continued)
² *Id.*

control services under any licensing scheme that is adopted whether provided by public safety or private entities.

In the NPRM the Commission noted that, 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. Private internal radio services used by “metropolitan transit systems” have been found to meet the above test.³

ITS America has recommended that the Commission define “public safety” for ITS purposes consistent with the definition of “public safety radio services” under Section 309(j)(2) of the Act. Under Section 309(j)(2) of the Act, mass transit applications have been identified as an eligible public safety radio service⁴. This definition is in full agreement with the goals of the ITS program which is to incorporate technology and advanced electronics 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.⁵

The Commission also proposed the following definition of public safety contained in Section 337(f)(1)⁶ of the ACT as stated below:

³ *Id.* at 19.

⁴ *Id.*

⁵ *Id.* at 4.

⁶ *Id.* at 21.

- (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.⁷

The Commission has previously concluded that all state or local government entities that provide public safety services not made commercially available to the public fall within the definition of Section 337(f)(1)⁸ of the Act. In STS's view, the above proposed definition and interpretation by the Commission also encompasses the goals of the ITS program and would include DSRC mass transit communication and control applications in the 5.9 GHz band as eligible services whether provide by public safety entities or by private entities authorized by a state or local government entity.

Irrespective of the definition of public safety ultimately adopted by the Commission, that definition must clearly permit state and local government entities as well as other entities to provide the public safety radio services as identified in the *Notice* in order to meet the goals of the ITS program set forth paragraph 4 of the *Notice*.

B. Licensing

⁷ *Id.*

⁸ 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).

The Commission also sought comment on various licensing schemes and the approach that would be best suited to furthering the deployment of ITS related services. In this regard, STS believes that the licensing scheme should account for public safety related radio services involving large numbers of units intended to be dispersed over geographic areas. A geographic licensing scheme will provide metropolitan mass transit services and other public related services envisioned by the ITS services with a method that minimizes the resource impact on those entities providing the service and also on the Commission. For example, a state or local government entity could provide a public safety related radio service for applications in surface transportation systems involving large numbers of onboard and roadside units that cover geographic areas of ten's of square miles or more. Due to the large numbers of transceivers required in this application, and considering local jurisdictional lines may potentially be crossed, it would be appropriate to permit a geopolitical area such as a state to be issued a default license and at the end of a window period, unclaimed spectrum could revert to a Regional Planning Committee. State and local government public safety entities would then be able to coordinate deployment of public service radio services to cooperatively insure that jurisdictional lines did not create a barrier to deployment of the services. Licensing under the above or similar procedure would permit multiple roadside units to be covered under one license. On board units, by virtue of their mobility should be licensed by rule or covered under a license issued for the roadside units. The above or similar licensing policy will provide the flexibility and freedom needed by the licensee to make changes in his system as new requirements develop and also provide for the orderly deployment of ITS services in a manner that will preclude interference between services.

II. Technical Issues

A. Interoperability

In the Notice the Commission has identified a large number of various services for which interoperable equipment is required for those service to be realized in the market place.

Examples, of such services are tag toll systems and information services used by industry and private individuals alike. Further, one goal of the ITS national architecture is to have all new passenger vehicles equipped with DSRC equipment. It is obvious that with the large-scale deployments envisioned in the above services, that equipment interoperability is a requirement.

However, it is significant that the Commission also identified ITS services where equipment interoperability is not a requirement and potentially undesirable. As an example, consider private internal radio services offered on a non-commercial basis such as a mass transit applications that are considered to be public safety related provided two specific tests are met. These private internal radio services have no need for equipment that is capable of interoperability with other services. In point of fact, interoperability with other systems may potentially put them at increased risk of interference from those other systems. For example, a dedicated internal radio system could utilize direct sequence or other spread spectrum techniques to achieve additional robustness against receiving interference from other systems. A requirement that all DSRC applications utilize a specific interoperability standard would preclude the use of this technology and strategy. Lacking any need to interoperate with other systems or services, private internal radio services should not be required to use equipment that is interoperable with other services.

STS recommends that the Commission adopt a flexible policy in regard to requiring interoperability. This policy should permit the licensee to stipulate whether the intended service

will be available only on an internal private radio service basis in which case the equipment would only need to conform to the basic power, channelization, spurious and out-of-band emission requirements. If the service is intended to be available and utilized by the public at large, it is appropriate that such service is provided through the use of interoperable equipment.

B. Channelization

STS supports the channelization plan proposed by ASTM-DSRC Standard. This plan is quite flexible and permits the needs of many services to be accommodated within it. It is workable for both interoperable and non-interoperable system concepts and provides for a variety of data rates, modulation bandwidths and technologies to be utilized.

C. Power and Emissions limits

The Commission correctly raised the issue of compliance measurements for power output and out-of-band emissions at this stage. STS supports the concept that compliance measurements should be made relative to the actual antenna input. Using this as the reference point for compliance measurements will permit transmitters to be located at variable distances from the actual antenna thus permitting added flexibility of system transmitter location without suffering a penalty in performance. With current programmable technology, adjustments in power level can easily be implemented that account for line losses and these line losses are easily identified and measured. Thus, compliance with the maximum EIRP limit will be maintained.

STS does have concerns with the proposed out-of-band emission mask proposed by Mark IV Industries.⁹ Mark IV recommended that attenuation “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)

⁹ *Notice of Proposed Rulemaking and Order*, FCC 03-302 (rel. November 15, 2002), at 28

of the transmitter in the licensee's sub band" is needed. STS considers this proposal to be overly stringent and unnecessary. While doable, the effect will be to significantly increase equipment cost with little or no benefit in interference reduction. It should be noted that the out-of-band emissions limits for many services such as those regulated under Parts 22, 24 and 90, only requires attenuation according to $43 + 10 \log (P)$ in dB. In many instances the user densities associated with those services is likely to exceed the user densities for the ITS services.

Accordingly, STS recommends that out-of-band emissions for DSRC equipment operating in the 5.9 GHz band be attenuated according to $43 + 10 \log (P)$ in dB.

III. Summary

Private internal radio services such as those providing mass transit communications and control capability are within the scope of intended services envisioned by the Department of Transportation and the Intelligent Transportation Society of America (“ITS America”) that was selected as the Federal Advisory Committee in ITS matters. Accordingly, the Commission should ensure that it adopts eligibility rules that permit this service to utilize the 5.9 GHz band. Further, the 5.9 GHz band was allocated to provide services to the public at large. It is incumbent on the Commission to adopt policies that minimize the cost and impact on resources related to the actual licensing processes for these services. Services in this band will typically be provided across large geographic areas. Issuing default licenses to a geopolitical region such as States will allow licenses to be issued for those services that are deemed by the states to best serve the public interest, convenience and necessity. Providing initial default licenses to States will also facilitate resolution of any jurisdictional issues related to various services that may be licensed, whether they are interstate or intrastate in nature. The Commission should adopt a licensing scheme using a State geopolitical approach.

STS has defined two types of services that will be provided by systems operating in the 5.9 GHz band. Equipment providing services to be utilized by the general public have a demonstrable need for interoperability. However, systems that are for private internal use only should be excluded from this requirement. Exclusion from the requirement will reduce potential interference between the general public and qualifying private radio services and permit those private radio services to use technologies that have increased robustness from interference that may be critical in certain applications. STS supports the proposed power limits and

channelization plan and urges the following policies and modifications be incorporated in the technical requirements:

- in order to permit variability of installation that will be a necessity considering the plethora of services to be offered, it is ideal for the Commission to permit measurement for compliance purposes to be shown at the actual antenna input port or, in the case of use of an antenna array, the input to the antenna array;
- the out-of-band emissions attenuation proposal is overly stringent and should be changed to the level $(43 + 10 \log(P))$ that is required by the technical rules applicable to equipment operating in most other regulated services.

Respectfully submitted,

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