Before the

FEDERAL COMMUNICATIONS COMMISSION

OFFICE OF SECRETARY
445 12TH ST. S.W. TW-A235
Washington, DC 20554

In the Matter of Amendment of the Commission's Rules Regarding Dedicated Short-Range Communications in the 5.850-5.925 GHz Band (5.9 GHz Band), WT Docket No. 01-90

Comments of

IBTTA

INTERNATIONAL BRIDGE, TUNNEL & TURNPIKE ASSOCIATION

1146 19TH STREET NW SUITE 800
Washington DC 20036

March 14th 2003

BACKGROUND

IBTTA is the not-for-profit trade association representing the worldwide toll industry. Our members operate more than 250 facilities in 25 countries, carrying more than 9 billion vehicles each year.

Our US representation consists of more than 53 authorities operating 130 toll roads, bridges or tunnels. These facilities represent more than 4200 miles of roadway, serving some 3.5 billion vehicles, which traveled over 42 million miles on their facilities. Toll facilities are acknowledged as early leaders in the use of ITS through their deployment of Dedicated Short Range Communication devices in support of the most ubiquitous and popular application of DSRC today, namely Electronic Toll Collection. The first installations of these technologies occurred in Texas in 1988. Since then, the figure has grown significantly as greater numbers of agencies adopt these technologies or plan to do so in the near future.

5.9GHz and IBTTA

IBTTA has always supporting the creation of the 5.850-5.925GHz (5.9GHz) ITS Radio Services (RS) band for Dedicated Short Range Communication (DSRC) services for several reasons:

1) Through licensed access, toll agencies in the US will receive co-primary status protection against interference. Current 915 MHz licenses only provide secondary status protection.

2) The large bandwidth and higher data rates will support faster transaction times and the excess bandwidth can be used to provide toll customers with other wanted intelligent transportation-related communication services.

3) A government rule requiring a standardized, defined, and interoperable communication device and mode would result in this being installed in all U.S. vehicles. Devices could be installed onboard all new vehicles to support new safety initiatives. This installed ITS RS band device can provide an enabling mechanism for a national, interoperable method for Electronic Toll Collection (ETC). To support this ultimate goal, IBTTA has supported the creation of an independent non-profit organization called OmniAir^{SM} that is working with the ITS RS Band standards' writers to define this interoperable methodology.

4) The 5.9GHz RS Band moves the United States into harmony with DSRC frequency used for similar purposes in Europe, Japan and other parts of the world. IBTTA members believe that global convergence on a shared 'ITS Band' can yield production efficiencies which reduce the cost of components and systems.

SUMMARY

IBTTA supports toll-financed transportation as a critical contributor to improved personal and commercial mobility. Furthermore, with the advent of electronic toll collection, the industry has come to depend on it's enabler, DSRC, to further the industry's mission of providing safe and efficient transportation services to its customers, often in the face of static physical road capacity and growing demand. To continue this service, toll agencies require not only adequate and secure radio spectrum, but stand to benefit from the greater communication capacity inherent in the new spectrum as well as the standardized specifications being developed for it by the American Society of Testing and Materials since the 1999 FCC allocation.

It is critical to IBTTA members that the FCC recognizes the value of and the importance of a standardized, fully interoperable communication mode that is free of proprietary equipment restrictions.

Our lessons learned over the last eight years of ETC demonstrate that a non-competitive proprietary deployment of Roadside and On-Board Units (RSU and OBU) is price inelastic in the face of growing volumes, increased production cost efficiency and wide public acceptance. This means that no matter how popular the application, how widespread the technology, or how large the market, the price stays the same. This is contrary to what should happen in a 'true' market and has been a unique trait of ETC compared to all other consumer electronics. For next-generation ETC systems, this cannot continue to be the case. If it is, the tolling industry may not deploy next generation systems. As such, open standards are critical to DSRC deployments that occur efficiently and quickly.

It is also important that the FCC understand that if the band can be shared among public safety, public service, and private users, it will lead to the introduction of on-board units as original equipment manufactured (OEM) hardware. This will occur because private service suppliers and the automobile manufacturers will obtain a financial return for the installation of these devices. This will eliminate the toll agency's required purchase and distribution of ETC 'tags'.

As such, IBTTA strongly recommends that the Federal Communications Commission, in its final rules, stipulate and require users of RS licenses in the 5.850-5.925GHz frequency band to utilize the ASTM consensus standards.

IBTTA also maintains that users of current 915MHz-based DSRC ETC systems should not be subject to forced migration. Over $1.5 billion has been invested in current electronic toll collection systems, and the industry must be permitted to voluntarily vacate the frequency and migrate when economic and technical conditions permit adoption of 'next generation DSRC services.

COMMENTS

The FCC has requested comments on many areas of its proposed rules. IBTTA has analyzed these comment requests and has presented these eight observations, statements and opinions below that reflect the issues of most importance to the toll industry.

1) The FCC Rules and Communication Standards

IBTTA is aware that the FCC does not generally define methods of communications for the bands it allocates. Instead, competition by vendors and potential users of the allocated band can develop effective and cost efficient communication methods and that the 'best solution' will emerge. This reluctance is understandable but the ITS RS band represents a unique situation.

First, due to the expected heavy use of this spectrum by safety applications, it is imperative that all systems conform to the standards. This would keep a non-compliant system from blocking the communication channel and the subsequent delivery of important data, instructions, etc., during a critical safety operation.

Second, as discussed earlier, it is in the best interest of all stakeholders and users that nationally interoperable systems emerge from these developments. Various regions have addressed interoperability issues by forming cooperative organizations such as the Inter Agency Group in the north east region of the US, Team Florida, Team Texas, California Toll Operators Cooperative, etc. Customers of toll roads have been very supportive of these regional efforts but are already demanding more interoperability between these regions and even across borders into Canada and Mexico. The toll agencies and their suppliers have attempted to address this interoperability with a patchwork of multi-mode Readers and Transponders. This has led to the development of complex – and proprietary - system implementations that place limits on ETC performance.

Third, it is imperative that the FCC writes rules for the ITS RS band that support a national communication standard. Once the standard is in place, an interoperable system can be developed for safety and all manner of ITS vehicle-to-roadside and vehicle-to-vehicle communications. The FCC should consider the ITS RS band in a manner similar to the Television and AM/FM radio bands. In these bands, standards for transmission were implemented, and the broadcast industry used these standards in the development of an internationally interoperable communication system. The FCC should also continue to provide operating licenses in the 915 MHz band to support ETC systems operating in that band.

Last, but not least, while not directly associated with ETC systems, the standardized, interoperable ITS RS band DSRC system can be used to support homeland security. This standardized, interoperable DSRC system could be used to provide vehicle passengers with timely security and emergency information.

2) To License Roadside Units (RSUs) by Site or Geographical Area

A site license will provide the most effective licensing method. Using this method, toll agencies and authorities can obtain a channel license that could be used at all its tolling points. No other Roadside Unit (RSU) would be allowed to use that channel unless its sharing of the channel would not interfere with the tolling system. The FCC-approved Frequency Coordinator would only recommended a license approval if channel sharing would not interfere with the toll system communications. The continued issuing, such as the 900 MHz band, of 'corridor' licenses should be continued. These corridor licenses grant a toll agency the right to use DSRC allocated channels for their entire contiguous highway system.

Summary:

- RSU licenses should be issued by site to provide the maximum protection to public safety and public service operations.
- RSU geographical licenses could result in interference conditions that would disrupt the toll agencies delivery of services and distribution of ITS information to its customers.
- RSU corridor licenses should be granted to toll agencies and authorities for the entire toll highway system.
- Licensed toll operations in the 900 MHz band should be extended until toll operators choose to migrate to the 5900 MHz band.

3) To Permit Non-public Safety DSRC Operations in the 5.9 GHz Band

IBTTA believes the private use of some channels of the ITS RS Band will promote the widespread deployment of on-board units. Our analysis shows that the data capacity of the ITS RS band (more than 250 times that available at 900 MHz) will support the sharing of the band between public safety, public service, and private operations. In addition, OmniAir^{SM} is working with standards writing groups in defining a method of operation that will support a 'dual band' OBU. This 'dual band' OBU will support ITS RS band use for public service and safety plus private uses in the adjacent Unlicensed National Information Infrastructure (UNII) Band and further mitigate interference.

Summary:

- Widespread deployment of ITS RS Band roadside units will lead to original equipment manufacturer-installation of onboard units into vehicles.
- A truly effective distribution of ITS public safety and services is thus most likely to occur with the spread of original equipment manufactured onboard units.
- Continued enhancement to roadside unit and onboard unit capabilities will occur with efficient, non-interference private use of the ITS RS Band.

- A low cost high performance DSRC communication device, such as those envisioned in the ITS RS band, is most likely to be achieved given large volume production. Private systems operating in the ITS RS Band will lead to large volume production of onboard units and roadside units.

4) The Definition of 'Public Safety' in the context of ITS

To IBTTA and its members, the term 'Public Safety' has a broader connotation than that which is associated with communications used by police, fire, and ambulance services. Information provided to vehicle drivers that provide them with construction, road hazard, traffic congestion, and route guidance information also add to the public's driving safety.

Summary:

- Public safety is served whenever the driver is provided with reliable and timely highway information. Therefore, any system that provides this type of information is providing a public safety service.
- Tolled systems should be considered public service organizations since these facilities are authorized by government authorities and provide a public transportation service.
- Tolling systems using the ITS RS Band can provide a public service by the rapid distribution of highway information to drivers.
- Tolling authorities will distribute highway safety information because doing so will reduce accidents. Further, in-vehicle DSRC communications such as those envisioned will do this more specifically, more quickly, and more accurately than the current highway advisory radio model.
- A high performance, interoperable, universally deployed OBU will in some cases be used for 'Open Road Tolling'. The effective implementation of an 'all Open Road Tolling System' can lead directly to the removal of toll plazas and toll equipment at exits and entries. Traffic flows will increase and barrier-related highway accidents will decrease.

5) Achieving the Interoperability Necessary for DSRC Operations

OmniAir[SM] is working with the ASTM and IEEE standards writing organizations to develop an ITS RS band standard that will assure interoperability. It is also working with DSRC manufacturers, application service providers, and users to develop a certification process that tests and verifies performance with the standard and the interoperability of all ITS RS band OmniAir[SM] certified devices. Standard compliance and interoperability certification is essential for national ETC interoperability.

Summary:

- Effective public safety and public service providers require interoperable systems. A truly interoperable OBU would support the development of a nationwide ETC infrastructure. An equal challenge is 'back-room' interoperability between operators and other application service providers. OmniAir[SM] is addressing these business rules in addition to the technical requirements.
- Interoperable OBUs and RSUs would support the development of a common ETC system design, provide improved performance, and lead to a fully Open Road Tolling system that would eliminate toll barriers and plazas.
- Interoperability should be achieved using standards such as ASTM and IEEE. De facto standards based on specific vendors will lead to sole source procurements and higher end costs.
- IBTTA believes that an independent organization, such as OmniAir[SM], should be used to provide an independent determination of interoperability and standard compliance.

6) Licensing Onboard Units Associated With Fixed Systems Under the 'Associated RSU license.'

Onboard Units should be licensed based on the RSU license. This is the current method used in the 915 MHz band for electronic toll collection. Using this approach, the RSU controls the transmissions of the OBU. This control allows the RSU to execute transactions with an OBU in a timely and orderly manner. These devices will also perform vehicle-to- vehicle (OBU-to-OBU) communications in support of safety applications, but in vehicle-to-roadside service, no OBU will transmit unless commanded by an RSU, thus reducing potential interference.

Summary:

- ETC systems nationwide use OBU operation based on an RSU license. This approach has proven very effective for tolling agencies.
- Effective system ETC operations require the organized, controlled communication environment that an RSU licensed operation provides.
- RSU control of all transmissions in its communication zone is required for effective ETC performance. Transmission outside of an RSU communication zone can be utilized for vehicle-to-vehicle communications, and coordinated, namely, with safety-related vehicle-to-vehicle communications, which take priority and are not be pre-empted by ETC.

7) Whether Onboard Units Not Associated With a Fixed System Should be Licensed by Rule or Unlicensed Under Part 15

Public Safety and automobile manufacturer's representatives have discussed DSRC implementations that can be used in their systems. They all agree that independent operation of an OBU (not under the control of an RSU) will be required. This is their RFID feature for vehicle identification, tracking, and servicing applications. As an example, when a vehicle has an accident and the air bags are deployed, the OBU would transmit a hazard warning that would be received by other vehicle OBUs that approach the accident scene. Because of situations like this, the independent operation of the OBU is required. Therefore the real issue is whether these transmissions should be licensed or unlicensed.

The 'unlicensed under Part 15' only limits the transmit power level of a device. The devices can operate anywhere with the provision that they 'cannot interfere with a licensed sites operation' or pre-empt a safety-related transmissions. The unlicensed OBU can execute any operation and transmit at any time provided it meets these Part 15 limits. On the other hand the 'licensed by rule' requires not only limits on the transmit power levels but requires the OBUs to follow specific rules in these operations. The standards' writers have been developing rules that will control these emissions and mitigate any potential interference with licensed RSU sites.

Summary:

- Licensed by rule OBU emissions should include controls on transmissions to mitigate interference with RSU communications.
- Part 15 OBUs do not provide adequate protection for public safety and public service applications.
- Licensed by rule OBU operation will provide an operating environment where all emissions are controlled by standards. This will minimize the potential for any system-to-system interference.
- If unlicensed OBU operation is required it should occur in the UNII band, as that band was designated for unlicensed use.

8) 'Various Channelization Plans' & 'Use of this Band in Mexican and Canadian Border Areas.'

For effective DSRC operation in North America, a channel plan must be coordinated with both Canada and Mexico. The standards writing organizations have representatives from Canada as well as the United States. They have also provided Mexican officials with copies of channelization plans for comment. The channel plan presented by ITS America to the FCC was developed from this process. It will insure effective ETC operations in all of North America, is consistent with wireless devices based on IEEE 802.11, and it is recommended that it should be used by the FCC in the allocation of the ITS RS band.

Summary:

- The ITS America band plan's development has been coordinated in both Canada and Mexico and should be used by the FCC for the ITS RS band.
- For nationwide ETC operations, a band plan that is common with Canada and Mexico aids effectiveness.
- Numerous border crossings occur between the US and Canada and Mexico. A number of these border crossings utilize toll fees for their maintenance and operation, and DSRC is currently used for the transmission of commercial vehicle manifest information as well.
- A common ITS RS band plan is required to avoid transmission interference across these international borders.
- The devices developed for this band can also be used to track goods shipped across national borders. The ITS America band plan allows for the use of these devices on all sides of the border and supports border security requirements.

CONCLUSION

IBTTA appreciates the interest of the Federal Communications Commission in their effort to enable the use of this ITS RS band for current and future ITS DSRC services. We urge the Commission to complete this process in an expeditious manner. Substantial resources have been invested in ETC and other ITS uses by toll authorities, public agencies and the private sector. Many others are at the decision point and will base their decisions on the availability of new technologies and new rules. It is thus imperative that proposed rules be set, or else the industry will have fewer incentives to commit the needed financial and staff resources to bring these capable systems to the individual and commercial motoring public.

Respectfully submitted,

Timothy J. McGuckin, Director
Technology Programs
IBTTA
1146 19th Street, NW Suite 800
Washington, DC 20036
202-659-4620

March 17th, 2003