

**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of:)
)
Office of Engineering and Technology Seeks) ET Docket No. 18-284
Comment on Metrom Rail LLC Request for)
Waiver of Part 15 Ultra-Wideband Rules for a)
Positive Train Control System)

**REPLY COMMENTS OF
THE NATIONAL PUBLIC SAFETY TELECOMMUNICATIONS COUNCIL**

The National Public Safety Telecommunications Council (NPSTC) submits these reply comments in response to the Public Notice in the above captioned proceeding.¹ The Public Notice seeks comment on a request to waive specific technical requirements in the Part 15 rules for unlicensed ultra-wideband technology, to enable a positive train control system in the 3 GHz to 5 GHz spectrum. NPSTC is aware of the benefits of positive train control systems but has concerns about potential interference to the public safety 4.9 GHz band from the applicant's implementation. Accordingly, in these reply comments, NPSTC discusses these concerns and recommends some appropriate conditions should the Commission choose to grant the requested waivers.

¹ *Public Notice*, DA-18-973 in ET Docket No. 18-284, released October 22, 2018.

The National Public Safety Telecommunications Council

The National Public Safety Telecommunications Council is a federation of public safety organizations whose mission is to improve public safety communications and interoperability through collaborative leadership. NPSTC pursues the role of being a resource and providing advocacy for public safety organizations in the United States on matters relating to public safety telecommunications. NPSTC has promoted implementation of the Public Safety Wireless Advisory Committee (PSWAC) and the 700 MHz Public Safety National Coordination Committee (NCC) recommendations. NPSTC explores technologies and public policy involving public safety telecommunications, analyzes the ramifications of particular issues and submits comments to governmental bodies with the objective of furthering public safety telecommunications worldwide. NPSTC serves as a standing forum for the exchange of ideas and information for effective public safety telecommunications.

The following 16 organizations serve on NPSTC's Governing Board:²

- American Association of State Highway and Transportation Officials
- American Radio Relay League
- Association of Fish and Wildlife Agencies
- Association of Public-Safety Communications Officials-International
- Forestry Conservation Communications Association
- International Association of Chiefs of Police
- International Association of Emergency Managers
- International Association of Fire Chiefs
- International Municipal Signal Association
- National Association of State Chief Information Officers
- National Association of State Emergency Medical Services Officials
- National Association of State Foresters
- National Association of State Technology Directors
- National Council of Statewide Interoperability Coordinators
- National Emergency Number Association
- National Sheriffs' Association

² These comments represent the views of the NPSTC Governing Board member organizations.

Several federal agencies are liaison members of NPSTC. These include the Department of Homeland Security (the Federal Emergency Management Agency, the Office of Emergency Communications, the Office for Interoperability and Compatibility, and the SAFECOM Program); Department of Commerce (National Telecommunications and Information Administration); Department of the Interior; and the Department of Justice (National Institute of Justice, Communications Technology Program). Also, Public Safety Europe is a liaison member. NPSTC has relationships with associate members: The Canadian Interoperability Technology Interest Group (CITIG) and the Utilities Technology Council (UTC), and affiliate members: The Alliance for Telecommunications Industry Solutions (ATIS), Open Mobile Alliance (OMA), Telecommunications Industry Association (TIA), TETRA Critical Communications Association (TCCA), and Project 25 Technology Interest Group (PTIG).

NPSTC Comments

Metrom Rail, LLC (Metrom) has developed its AURA positive train control system that operates with ultra-wideband technology (UWB) in the 3.272-5.014 GHz spectrum. Metrom indicates that it designs, builds and tests its complete line of products at its Crystal Lake, Illinois headquarters. Metrom also indicates that its AURA positive train control system is “at least 50% less expensive and can be implemented in a fraction of the time compared to PTC systems using the traditional approach.”³

UWB unlicensed devices are regulated under Part 15 of the Commission’s rules. The Public Notice seeks comment on Metrom Rail, LLC’s request for waiver of Sections 15.519(a) and 15.519(c) of these rules. Section 15.519(a) specifies that UWB devices operating under that section must be handheld and may not employ a fixed infrastructure. Section 15.519 (c) sets the

³ Metrom Rail, LLC Request for Waiver, filed September 4, 2018, at page 4.

radiated emission limits and sets the maximum allowed power level of UWB devices. Metrom indicates the system consists of UWB devices both on a train and positioned at fixed locations trackside and therefore needs a waiver of the handheld-only requirement in Section 15.519(a). Metrom also requests a waiver of the effective radiated power limits so it can use directional antennas on some of the UWB units in the positive train control system to gain additional signaling range from 900-1000 feet up to 1200-1300 feet, and reduce the number of units required. Metrom's request to use a 6 dB gain directional antenna would raise the effective isotropic radiated power (EIRP) from the -41.3 dBm maximum limit specified in Section 15.519(c) of the rules to a higher level of -35.3 dBm.

Metrom states that the requested waivers are for initial operation in the Boston metropolitan area with the Massachusetts Bay Transportation Authority, in the New York City metropolitan area with the New York City Metropolitan Transportation Authority, in the Los Angeles County Metropolitan Transportation Authority and, "ultimately to expand to the rest of the United States should certain conditions be met." ⁴

NPSTC is aware of the benefits of positive train control systems and congratulates Metrom on developing a PTC system that has received potential interest in the Boston, Los Angeles and New York metropolitan areas to enhance passenger safety. However, NPSTC has concerns about potential interference to the public safety 4.9 GHz band from the applicant's implementation. As more fully addressed in the NPSTC comments to the Commission's recent Sixth Further Notice of Proposed Rulemaking (Sixth FNPRM) in WP Docket NO. 07-100, public safety entities use the spectrum at 4.94 to 4.99 GHz (the 4.9 GHz band) for fixed, temporary fixed and some mobile operations. New

⁴ Metrom Request for Waiver at page 1.

York City, one of the areas for which Metrom requests its waiver, has extensive 4.9 GHz operations.

As noted in the NPSTC comments to the Sixth FNPRM:

...The NYPD utilizes 4.9 GHz to support video monitoring operations at numerous locations throughout the City. The 4.9 GHz public safety spectrum is also used for backhaul. The Port Authority uses 4.9 GHz spectrum in support of security operations at its facilities within the city. The 4.9 GHz band is used by the Metropolitan Transportation Authority. NYC MTA is the largest underground mass transit system in the U.S. NYC MTA has implemented a dedicated 4.9 GHz public safety broadband network, as part of a project to enhance safety and connectivity in its subway system facilities. The City has successfully deployed 4.9 GHz nodes in close proximity by using vertical separation and has noted that additional isolation can be achieved by utilizing alternate polarizations when deploying 4.9 GHz nodes in close proximity to each other.⁵

NPSTC Comments also noted usage of 4.9 GHz in the City of Los Angeles and the City of Long Beach.⁶

The City of Los Angeles, CA:

The City of Los Angeles utilizes the 4.9 GHz band to support video aggregation points for surveillance systems at LAX, Jordan Downs, Mac Arthur Park and other locations, and for backhaul to/from the above areas. In addition, the City uses 4.9 GHz for on-scene mesh networks and for point-to-point links for T-1s at command posts. The City also uses 4.9 GHz for airborne public safety video operations under a waiver.

The City of Long Beach, CA:

The City of Long Beach holds 10 licenses in the 4.9 GHz band that primarily support general police operations. Uses include fixed operations and robotic units. In addition, the City uses 4.9 GHz for airborne public safety video operations under a waiver. Secure public safety awareness of activity in this port city is critical for the protection of the public. As the second-busiest container sea port in the United States, the Port of Long Beach handles trade valued at more than \$180 billion annually and supports 1.4 million trade-related jobs across the nation, including 300,000 in Southern California. The Port serves 175 shipping lines with connections to 217 seaports around the world. Goods moving through the Port reach every U.S. congressional district. In 2017, the Port handled more than 7.5 million container units, achieving the busiest year in its 107-year history.

⁵ NPSTC Comments, WP Docket No. 07-100, July 6, 2018, at page 11.

⁶ NPSTC Comments, WP Docket No. 07-100, July 6, 2018, at page 10.

The metropolitan area of Los Angeles, another area for which Metrom requests its UWB waivers would overlap these cities' use of 4.9 GHz.

In its waiver request, Metrom notes there were no reports of interference as a result of its testing under an experimental license. Regarding its experimental testing with the New York City MTA, Metrom states "As all operations are underground and heavily shielded by the subway tunnels, the risk of harmful interference to authorized systems is minimal and to date there have been no reported incidences of interference."⁷ However, operation underground does not emulate the interference potential of above-ground trackside operations that would result from regular deployments under the requested waiver.

In its discussion on interference, Metrom recognized some of the authorized users of spectrum in the 3 to 5 GHz range. However, that discussion did not specifically mention public safety use of the 4.9 GHz band as potential operations that would need to be protected against any interference. Accordingly, NPSTC is unsure if Metrom is aware of the 4.9 GHz public safety operations, and if Metrom considered these operations when developing its waiver request.

NPSTC understands that potential interference to the 4.9 GHz band from the Metrom positive train control system deployment would likely be in the vicinity of the tracks along which the system is deployed. When transmitting, an ultra-wideband signal looks like a broadband noise signal and the potential interference level depends on the sum of the signal across the bandwidth of the victim receiver. The point from which such an interfering signal emanates can be difficult to determine. As an unlicensed system, unless provisions are made to catalog where the devices are deployed, there would be no records available to use in resolving interference if it did occur.

⁷ Metrom Request for Waiver at page 9.

The current rulemaking in WP Docket 07-100 proposes steps to ensure a more complete data base of licensed 4.9 GHz deployments going forward to help enable better frequency coordination and more efficient spectrum usage. While in a different proceeding, the Metrom waiver requested would in essence place new devices in spectrum that overlap the 4.9 GHz band at unspecified locations on an unlicensed basis. Unless steps are taken to maintain a database of the location of Metrom's UWB devices, deployment of these devices appear to be counterintuitive to the goals of the 4.9 GHz proceeding in WP Docket 07-100.

In view of the above, NPSTC recommends the following conditions be attached if the Commission decides to grant Metrom its requested waivers:

- 1) Metrom must maintain a record of the location of its UWB devices deployed for Advanced Train Control;
- 2) Initial deployments in the Boston, Los Angeles and New York Metropolitan areas must include testing of potential interference, including potential interference to public safety 4.9 GHz operations; and
- 3) Metrom or its advanced train control customers must maintain a "stop buzzer" function with a named point of contact and relevant contact information, who can be called immediately to turn off the system should interference be experienced.

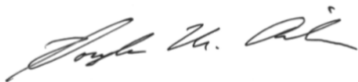
NPSTC notes that the third condition above is similar to one also recommended in the first round of comments by Aviation Spectrum Resources, Inc. (ASRI). ASRI raised some concerns about potential interference to aviation operations in the 3.1 GHz to 5.3 GHz spectrum and as a result posed some questions about the planned deployment of the Metrom Rail, LLC devices, and recommended the "stop buzzer" function be created, regardless of any further assessment based on the questions it raised.⁸ NPSTC supports ASRI's recommendation.

⁸ Comments of Aviation Spectrum Resources, Inc., October 22, 2018, at pages 3 and 4.

Conclusion

NPSTC appreciates the opportunity to provide recommendations on the waiver request of Metrom Rail, LLC, for an unlicensed positive train control system using ultra-wideband (UWB) technology that would operate in the 3.272-5.014 GHz spectrum, and therefore would overlap the public safety 4.9 GHz band. NPSTC is aware of the benefits of a positive train control system, but is concerned that Metrom may not have considered potential interference to public safety 4.9 GHz operations in developing its request. Also, this request to deploy UWB devices on an unlicensed basis at unspecified locations is counterintuitive to Commission efforts in WP Docket 07-100 to develop a more complete database of deployments in the 4.9 GHz band. Accordingly, in these reply comments NPSTC recommends three conditions that should be included if the Commission grants Metrom's requested waivers. These conditions would require that a list of UWB deployment locations be maintained, that testing for potential interference to the 4.9 GHz band be conducted in initial UWB deployments in the Boston, Los Angeles and New York metropolitan areas and that a "stop buzzer" function with a named contact be created to address any interference that occurs.

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