

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554**

In the Matter of)	
)	
The Rail Network, Inc.)	ET Docket 06-161
Request for Waiver of Section 15.209 of the)	
Commission's Rules)	
)	

REPLY COMMENTS OF THE RAIL NETWORK, INC.

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SUMMARY

By its June 23, 2006 Waiver Request, TRN demonstrated that its proposed audio service for commuter trains and metropolitan transit systems will serve the public interest in a number of ways and will do so without causing harmful interference.

On August 17, 2006, the Commission invited comment on the TRN proposal. Only one entity submitted comments in response to the Commission invitation. That entity largely posed only questions about the operation of the proposed system. In response, TRN demonstrates again the multiple and significant public interest benefits associated with its proposal, responds to Commenter's pertinent inquiries and shows that grant of TRN's Waiver Request would cause harmful interference to no one.

Chief among the public interest benefits associated with the TRN proposal is the added communications capability that TRN's system presents. TRN submits that any material improvement in communications capabilities will contribute to the public interest, especially in times of emergency. Moreover, in the instance of TRN's pending waiver request, there are no counterbalancing disadvantages associated with its grant.

For all of the above reasons, TRN renews its urging that the TRN Waiver Request be granted.

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The Rail Network, Inc. ("TRN"), by its attorneys and pursuant to the Commission's August 17, 2006 Public Notice, DA 06-1649, hereby submits its Reply Comments in the captioned proceeding. As the Commission is aware, only one party, the National Association of Broadcasters ("NAB" or "Commenter") submitted any comments in response to TRN's request for waiver of the power limit of Section 15.209 to permit unlicensed operation of TRN's proposed rail car audio programming service (the "TRN Waiver Request"). In its comments, Commenter, for the most part, simply posed questions rather than proffering any credible arguments challenging the merits of the TRN Waiver Request. By these Reply Comments, TRN again demonstrates why grant of the TRN Waiver Request would serve the public interest and would not cause harmful interference. In support, the following is shown.

I. DISCUSSION

A. Background

TRN proposed a limited waiver of the power limit of Section 15.209 of up to 87 dBuV/m to allow implementation of its proposed audio programming service on commuter trains and metropolitan transit systems. A prototype of TRN's system is currently operating pursuant to experimental station license WD2XOW. As TRN explained in the TRN Waiver Request, its

system is designed to enhance passenger services, including passenger safety. The system delivers informational and entertainment programming over video and on up to seven channels to passengers through the expedient of an FM receiver. Among other things, the system allows for delivery of the audio portion of video programming in multiple languages and transit information, including safety or emergency communications. In addition, TRN installs certain network components which can be used as part of a larger network to provide video surveillance and two-way broadband if the transit authority decides to implement such services. No party objected to the TRN Waiver Request with the sole exception of Commenter, and Commenter principally asks only for additional information. Commenter also questioned the extent that the system would promote general safety and facilitate communications in an emergency. Among other things, TRN's Waiver Request demonstrated the critical public safety considerations that the TRN network can provide in the event of a metro rail emergency. As shown in the TRN Waiver Request and again below, TRN's system is designed to prevent harmful interference. Moreover, the lack of harmful interference has been verified by actual system tests. While many of Commenter's concerns are misguided and irrelevant, we now address each of their comments in an effort to provide a full record.

B. Response to Commenter Concerns

Request for Antenna and Transmitter Information. Commenter suggests that the Commission should analyze first the possibility of interference from TRN's system, and second, apply appropriate restrictions on the installation and use of the system. NAB at 2. Commenter claims a lack of technical data to evaluate the proposed waiver, such as the type of antenna and transmitter and the frequencies to be used in the various localities in which it proposes to

operate. NAB Comments, at 3. These concerns are largely irrelevant and should be given no credence by the Commission.

Part 15 emission limitations, including those of Rule Section 15.209, appropriately do not address types of transmitters or antennae. Instead Rule Section 15.209 imposes a limit on radiated power. And that is the only matter upon which TRN here requests a waiver. Notably, Commenter has not explained how any difference in the transmitter or the antenna could affect the interference potential of the proposed system. Nor could Commenter have done so – as it is (as the Commission’s own rules recognize) only power that matters. To illustrate, it makes no difference whether an antenna is a dipole or a whip.

TRN will, of course, configure its system to direct as much of the radiated signal as possible into the rail car and only into the rail car. In fact, TRN has already committed to do so in the TRN Waiver Request, at 11, where it advised the Commission that TRN will utilize antennae that are designed to direct signal along the entire length of the rail car – and in a manner that greatly reduces any signal leakage outside of the cars. TRN’s antennae are installed in such a manner so that emissions are intended to radiate from the front to the back of the rail vehicle and limit the emissions that travel outside the rail vehicle. TRN Waiver Request, at 11.

Request for Operating Frequencies. Commenter’s related question desiring specification of the individual frequencies in the six cities for which TRN initially proposes to deploy is also misplaced. As TRN made clear, it will not pre-select the frequencies. *See* TRN Waiver Request, at 10. TRN plans to analyze all available frequencies in each market where its network is deployed by performing tests when its rail cars are in live revenue operations. Only then will the frequencies be chosen, in order to ensure there is no harmful interference caused to a licensed

broadcaster. *See generally* TRN Waiver Request, at 10. In addition, TRN will attempt to avoid selecting channels where there are first adjacent channel stations licensed. Based on these channel selection criteria, it is unnecessary at this time to know the exact channels on which TRN would operate. Moreover, since station parameters and even allocations may change over time, such information would be of limited value to the Commission in making long run conclusions of interference potential.

Signal Attenuation. Commenter also asserts TRN has not studied the signal level likely to be found outside a rail car. NAB Comments, at 3-4. Commenter's concern is largely irrelevant because TRN has explained that its system will be configured to avoid operation on co-channel or adjacent channel frequencies licensed in the rail system service area. Furthermore, Commenter ignores that TRN included test results that show the emission levels from its system, at its requested power level, at three (3) meters from the antenna which will be located in the rail car. It appears that Commenter simply did not carefully review this information. The test was designed to simulate the emission levels from TRN's antenna inside a rail car to areas outside the rail car, without accounting for the additional attenuation that the rail car can provide. The test shows that the emission levels at a distance of three (3) meters from the antenna, which will be inside the rail car, will not cause harmful interference to any licensed broadcaster's signal on a station platform, passing train and, despite Commenter's vivid imagination, any other outside locations such as neighboring highways, office buildings, homes, parking lots and other places outside transit authority property. Additionally, the levels recorded during testing represent the highest emission levels possible, as they were recorded in an environment designed to simulate when a train is at a station or end point with its doors open. The actual emission levels plainly

will be reduced much further by the physical characteristics of a rail car which include a steel frame surrounded by fiberglass and a metal outer casing that would greatly limit emissions outside the car.¹ In summary, TRN's system is designed to limit emissions outside the rail car, whether stationary or in motion, so as to avoid harmful interference with licensed broadcast signals.

Request for Maps. Commenter's suggestion that maps of the above ground portion of the transit systems in question are necessary to evaluate the interference potential misses the point. Signal levels will not rise to an interfering level outside the rail car, as demonstrated by TRN's test results included in the TRN Waiver Request and discussed above. Thus, what might lie on the property outside transit authority property is irrelevant. In any event, Commenter's concern seems to be buildings, roads or parking lots located within 1000 feet of the rail system. However, free space loss in the 88-108 MHz band at that distance is on the order of 61 to 63 db or 1/1,259,000 to 1/2,000,000. Real world signal loss is several times free space loss, depending on terrain and other propagation characteristic due to reflection, diffusion and scattering effects.² The chance of even an open radiator causing interference at that distance is exceedingly remote. TRN's system, of course, is enclosed in a mostly metal rail car which effectively blocks virtually

¹ See generally Hill & Kneisel, Portable Radio Antennae Performance in the 150, 450, 800, and 900 MHz Bands "Outside" and In-vehicle, 40 IEEE Transactions on Vehicle Technology 750 (1991). The researchers found an approximate 5 to 7 db signal attenuation at 150 MHz inside a vehicle. Loss from a rail car having a much lower proportion of windows to metal body will be substantially greater.

² See Rappaport, Wireless Communications - Principles & Practice, IEEE Press, 1996, pp. 130.

all of the radiated signal of its system from escaping.³ Commenter raises the related concern (at 4) of trains stopped at stations for several minutes waiting to reverse direction. Again, TRN refers to its tests that show that its system would not cause harmful interference at a distance of three (3) meters from the in-car antenna. In addition, TRN's system employs a shut down feature which turns the system off when trains are not in operation.

Power Level Proposed. Commenter further questions the proposed power level for TRN's system. As TRN explained, it determined through its testing that the 87 dBu emission level was necessary to provide full service to train passengers within the rail car.⁴ TRN Waiver Request, at 7.⁵ As TRN explained in the TRN Waiver Request, it has conducted extensive testing of audio transmission infrastructure, including potential locations for the antennae, different types of antennae and power levels and the power requested is "the minimum power necessary to provide quality service..." TRN Waiver Request, at 5. This is more than adequate support for the relief requested and Commenter has not provided anything to support an argument to the contrary.

³ TRN most emphatically did not concede that its system would cause interference as Commenter mistakenly asserts. NAB Comments, at 4. What TRN did suggest was that in the unlikely event interference did occur for some reason, it would be transitory due to the fact that trains move and usually operate at high speed. The fact that a number of trains may pass a certain point in a given day does not render any such interference anything other than transitory. In any event, if harmful interference does not radiate from a rail car – and TRN's measurements indicate that it will not – there would be no harmful interference, transitory or otherwise.

⁴ The power level at issue is slightly above that authorized for garage door openers and slightly below that authorized by cordless phones.

⁵ Commenter snipes at TRN's having discussed full service to train passengers as "100 percent quality," complaining that the term was undefined. So that Commenter can be satisfied, that wording was meant to convey the situation where all passengers, wherever located within the rail car would be able to receive system transmissions.

System Monitoring to Prevent and Avoid Harmful Interference. Commenter also suggests the need for further explanation of TRN's proposed monitoring operation to ensure the lack of harmful interference. NAB Comments, at 6. As TRN has already stated in the TRN Waiver Request, TRN will perform monitoring on FM receivers tuned to adjacent frequencies along the rail system to ensure the lack of harmful radiation. In addition, spectrum analyzers will be employed to ascertain the existence of potentially interfering signals along the rail route. If any harmful interference is detected, TRN would first attempt to change frequencies to eliminate the interference; in the unlikely event that an alternative frequency was not available, the potentially interfering signal would be turned off to eliminate the problem.

TRN urges the Commission to take note of the tenuous and disingenuous⁶ nature of Commenter's statements throughout its comments. Commenter itself admits that it is "unsure" about what technology would be sufficient. NAB Comments, at 7. In fact, in an effort to persuade the Commission, Commenter states that "it is inevitable that some amount of signal will escape the car." Id. Clearly, the Commenter's reliance on such baseless statements demonstrates the weakness of its comments and its willingness to resort to inaccurate statements calls into question the credibility of all of its assertions.

⁶ In the NAB Comments, at 6-7, Commenter provides only a small portion of a statement from the TRN Waiver Request and makes the false claim that "TRN acknowledge[s] potential interference to 'parties located further away.'" However, as Commenter knows, TRN's reference to "parties located further away" (TRN Waiver Request, at 12), served the exact opposite purpose from that which Commenter contends, as TRN stated, in full, that "TRN's system was designed to avoid interference with nearby trains and, of course, parties located further away such as on the train platform or within cars or homes that may be located near the rail system." TRN Waiver Request, at 12. TRN's statement was in the context of the larger paragraph describing how TRN's system is carefully engineered, installed and operated so as to avoid interference between adjacent rail vehicles which travel in the closest of proximities (as close as a few feet) so that parties located even further away should not be affected.

IBOC Technology. In another attempt to raise credible concerns, Commenter reaches to concoct questions about the potential impact on digital radio using the in-band/on channel (“IBOC”) technology developed by iBiquity Digital Corporation. NAB Comments, at 7. IBOC technology for FM encodes a digital signal on sidebands above and below the main analog carrier. Commenter speculates that it is possible that because of the lower power of the digital signal (as opposed to the main analog carrier) that an interfering signal from TRN’s operation could have a more significant impact on the digital signal than on the higher powered analog signal.

The very nature of the IBOC technology suggests interference is not a concern. As iBiquity explains:

its digital signals are broadcast as “sideband” transmissions bracketing the top and bottom of the ... “host” analog signal in order to make optimal usage of the current spectrum allocations. With more than half of stations currently facing interference from adjacent stations, this approach delivers redundant information on both sides of the current channel location in order to ensure optimal performance in all listening environments.

iBiquity Digital's IBOC technology further combats interference through our unique First Adjacent Cancellor (FAC) technology. FAC automatically differentiates between the digital sideband transmission and other analog signals that might be closely adjacent to the channel in order to suppress the interfering station.

iBiquity Digital's IBOC technology overcomes multipath interference and sources of noise through the use of proprietary coding and power combining techniques. This proprietary approach to error correction utilizes digital processors and powerful algorithms to constantly compare the quality of the two digital sideband transmissions, combining them to deliver additional power gain whenever possible and when not possible seamlessly switching to the more powerful of the two.

...

By employing the above techniques incorporating multiple digital signal techniques, such as redundant sidebands, blend, first adjacent cancellation, and code and power sharing, iBiquity Digital's IBOC technology is designed to capture a superior robust signal within a station's coverage area in order to ensure delivery of the benefits of HD Radio technology.

See http://www.ibiquity.com/hd_radio/iboc_white_papers. Thus the IBOC technology is specifically designed to tune out and suppress interfering signals. It must further be remembered that the IBOC signal rides above and below an analog signal several orders of magnitude higher than any potential interfering signal which TRN's system could generate. If the main carrier does not interfere with the digital IBOC signal, it hardly follows that the highly attenuated emissions from TRN's system would do so.

Public Safety Benefits. Finally, Commenter suggests the public interests benefits of TRN's proposed system are overstated. NAB Comments, at 7-8. First, it should be noted Commenter is obviously not an expert in the matter of providing information, emergency or otherwise, to rail passengers traveling on subway systems. In fact, to our knowledge, Commenter has no experience in the transit business whatsoever. The Commenter's arguments were especially curious in that it attempted to address only one of the several public benefits which TRN's system can provide as set forth in the TRN Waiver Request. TRN was further surprised that, given recent events both domestically and abroad (terrorist attacks, natural disasters, etc.), Commenter would go on public record with comments that attempt to minimize the importance of any technology which could provide important information in the event of an emergency. It is particularly offensive to TRN, and more importantly, to the public interest, that Commenter has employed the tactic of making reckless and dangerous statements such as its unfounded claim that "TRN's system...may undermine the delivery of emergency information."

NAB Comments, at 8. These comments are yet another example of its willingness to say anything in order to attempt to raise unfounded concerns about TRN's service.

The importance of systems which deliver information to passengers cannot be overstated. The Greater Cleveland Rapid Transit Authority ("GCRTA") issued a Request for Proposals for the type of services which TRN provides, explaining that "[e]ffectively communicating with our customers is critical to meeting the mission of the GCRTA."⁷ The Washington Metropolitan Area Transit Authority ("WMATA") has stated that "[c]ommunicating accurate real time information on rail, bus and para-transit system performance to customers is essential in maintaining high levels of customer satisfaction."⁸ WMATA has also explained that "[a]s part of WMATA's day-to-day operation, WMATA needs to both manage and disseminate information about an incident internally amongst WMATA operational and support staffs and simultaneously communicate the travel impacts to riding customers.... Communications to riders needs to be able to provide selective, timely, and frequent updates to those customers already within WMATA."⁹

In addition, passengers traveling on our nation's subway systems have overwhelmingly indicated the desire and need for additional passenger information. A survey of rail passengers conducted in several markets resulted in an overwhelming average of 83% of the passengers responding that an audio channel that provides updated transit information would be helpful.

⁷ GCRTA Request for Proposals 2005-155 Multimedia Passenger Information System.

⁸ WMATA Request for Expressions of Interest, June 2006, p. 6.

⁹ WMATA Request for Expressions of Interest, February 2006, p. 3.

Several transit authorities have sought, and are continuing to seek, the type of services which TRN provides. WMATA has recently pronounced, that “[t]o improve customer service, security readiness and revenue generation opportunities WMATA wants to move beyond past practices in technology deployment.”¹⁰ Further, the Metropolitan Atlanta Rapid Transit Authority provided the following as a reason for procuring TRN’s services: “In an effort to enhance the transit environment, the Authority is seeking to secure a video and audio entertainment network.... The Authority has determined that the ability to entertain and communicate to its over 500,000 daily...passengers is of great importance.... It has also been determined that the existence of this type of entertainment adds value to the transit system and will significantly improve our ability to enhance the MARTA experience, communicate to customers and could increase our overall system usage.”¹¹

¹⁰ WMATA Request for Expressions of Interest, June 2006, p. 3.

¹¹ MARTA Request for Proposals P4649, April 2003, Scope of Services p. 1. Other systems have relied on similar reasoning such as The Massachusetts Bay Transportation Authority which sought to “1) maximize potential non-fare revenue from advertising through the addition of this new media technology; 2) provide a new and positive rider experience and amenity through the broadcast of commercially produced content and transit information; 3) provide real time transit-related information to customers on-board its Rolling Stock; and 4) obtain a scalable electronic infrastructure at no cost to the Authority upon which future security enhancements may be added.” Massachusetts Bay Transportation Authority, Request for Proposals, October 31, 2005, at p. 4. In its Request for Expressions of Interest, June 2006 at p. 4, of which the services which TRN would provide is one part of an overall solution, WMATA described its goals as follows: “The first goal is to provide transit customers represented by the 1.4 million daily transit trips, with real time, high quality accurate information to facilitate their travel. The second goal is to generate a source of non-fare box revenue as reflected in the market value of the WMATA customer base and their connection to the 3.8 million households in the metropolitan area. The third goal is to enhance customer security.”

The TRN Waiver Request demonstrates that, among other things, the Commission would benefit the public by enhancing the opportunity for passengers to receive critical audio information in the event of an emergency such as a terrorist attack or natural disaster. Contrary to Commenter's distortion of TRN's statements, nowhere does TRN state that information would be provided "only over TRN's proposed system." NAB Comments, at 8. In fact TRN states that, "in an emergency, the transit authority may rely, in part, upon TRN's infrastructure to communicate to the passengers and provide critical audio information which must be available throughout the entire rail system." TRN Waiver Request, at 8. Commenter suggests a loudspeaker system is a more appropriate, and should be the sole, means of getting emergency information to rail service passengers instead of using the TRN system. First, any additional communications in time of emergency will be helpful, especially given the independent power components associated with TRN's system. Second, the loudspeaker system could be out of service or unintelligible, in which case the TRN system would be a welcomed compliment. In 2005, an organization entitled Straphangers conducted a survey of passengers that ride the New York Subway system. The survey showed that in 2005, on average, only 77% of in-car announcements were clear and able to be heard.¹² That means that almost 1 out of every 4 messages could not be heard. In the event of an emergency, that ratio is plainly unacceptable. Also, Straphangers found, based upon 6,600 separate observations, that in 65% of "delays and disruptions, there was either no announcement or an inaudible, garbled or incorrect one."¹³ Third, such systems are normally controlled by the train's operator who could be injured,

¹² Straphangers' News Release entitled "Basic Subway Car Announcements Improve, Survey Finds; Best Lines in Survey: 4 and 6; Worst: W Line. In 65% of Delays and Service Changes, There Was No Announcement or an Inaudible, Garbled or Incorrect One." www.straphangers.org

¹³ Id.

otherwise unavailable, or not have access to critical information. TRN's system, however, could allow the central operating authority of the rail system to convey messages to the passengers.¹⁴ In the event that TRN's systems assists the transit authority in disseminating timely information, and in particular emergency information that contributes to saving even one person's life, TRN's system plainly would have benefited the public in addition to all of the other public benefits set forth in the TRN Waiver Request.

¹⁴ Commenter also claims TRN's system could impede the distribution of emergency announcements by disrupting the signal of authorized FM radio stations. NAB Comments, at 8, n.12. That claim ignores a principal point underlying TRN's system's concept. In the case of urban mass transit rail systems, a large portion of the system is either underground or in areas where traditional signals are not able to be received. Further, the mostly metal rail cars moving throughout the system make reception of over the air radio broadcasts extremely limited if at all possible. It is because of the lack of reception and the limited ability for transit authorities to effectively and efficiently communicate with passengers that the operators of these rail systems need and desire the alternative source of information, news and other programming which TRN's system can provide.

II. CONCLUSION

As shown above and in the TRN Waiver Request, limited waiver of FCC Rule Section 15.209's power limitation is justified to allow operation of TRN's proposed rail car audio service. TRN's system has been demonstrated by measurement data not to cause harmful interference. TRN has explained how its system will work and what steps it will take to prevent harmful interference. TRN's system serves a vital public need, including enhancing emergency communications aboard rail systems. The system is clearly in the public interest and the requested waiver will therefore serve the public interest. For all of these reasons, the requested waiver should be granted promptly.

Respectfully submitted,

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