

**BIF RESPONSE TO TRAI CP ON ALLOTMENT OF SPECTRUM TO INDIAN RAILWAYS**  
**FOR PUBLIC SAFETY & SECURITY SERVICES**

**PREAMBLE**

Communications related to safety (including radio-navigation services) and RF spectrum for such applications, need to be treated separately from other communications – commercial or non-commercial. For example, spectrum requirements for aeronautical and maritime safety services are treated differently from that for communication needs and is not charged. TRAI has already recommended similar special treatment for spectrum needed for nationwide PPDR network.

The World Radiocommunication Conference (WRC) 2019 of ITU, scheduled to take place during 28 Oct. – 22 Nov. 2019 is considering, vide its Agenda Item No. 1.11 (reproduced below), spectrum for such emerging safety applications / needs of railway systems globally / regionally and this is expected to result in global harmonized spectrum usage and economy of scale.

“1.11 to take necessary actions, as appropriate, to facilitate global or regional harmonized frequency bands to support railway radiocommunication systems between train and trackside within existing mobile service allocations, in accordance with Resolution 236 (WRC-15)”;

Hence, it appears to be prudent to wait for the outcome of WRC-19, which is only few months away.

Essentially needed RF spectrum for similar safety applications on other modes of transport and / or for public safety in general (e.g. PPDR), should be treated similar to spectrum for aeronautical and maritime safety services.

Spectrum requirements for commercial communications (including those for passenger communications) should be treated differently at par with other commercial operations of Telecom Service Providers (TSPs), as is the case for In-Flight Connectivity and radiocommunication services for passengers on board ships, etc.

**Q.1 Whether spectrum in 700 MHz band should be assigned to Indian Railways for RSTT in India? Please provide justification for your response.**

**BIF Response**

BIF is of the clear opinion that 700MHz band should neither be reserved nor assigned to Indian Railways for Railway Radiocommunication System between Train and Trackside(RSTT). The reasons for the same are elaborated below:

1. With increased demand of data services & rapid consumption of data, which is exploding in India, with an annual growth rate of 23 per cent, the country requires sufficient spectrum in multiple bands for achieving the objectives of ‘Digital India’ as enunciated in NDCP-2018. 700 MHz is one of the prime spectrum bands which is proposed to be used for deployment of 5G services. It is very suitable for coverage purposes due to its excellent propagation characteristics & therefore it is one of the most sought after band for deployment of 5G.

2. TRAI in its recommendation dated 1 August 2018 for "Auction of Spectrum in 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300-3400 MHz and 3400-3600 MHz Bands" considered this band for the next spectrum auction, recognizing the vibrant and continuously growing ecosystem in the 700 MHz band to be used for 5G services in alignment with what is being deployed globally.

3. The 700Mhz band is a prime IMT band and is centric to Rural Broadband applications and for bridging the ‘Digital Divide. Not only is the 700Mhz band suitable for rural broadband solutions, it is also extremely suitable for In-building solutions in urban areas too.

4. The Band has been identified for IMT 2020 (5G) by ITU as well as NFAP.

5. 700 MHz Band is globally harmonised for IMT usage and many countries have deployment of mobile services in the band.. The 700 MHz Band plan 703-748/758-803 MHz has been adopted by APT countries occupying a total of 45 MHz paired spectrum. India too has followed this band plan. As such, the complete 45 MHz is required to be auctioned so that at least each operator gets 10+10 MHz for deployment of 5G.

6. Defence, which has been allocated 10Mhz paired spectrum in this band, may be requested / coordinated to vacate this band, keeping in view the national interest. In lieu of this spectrum, alternate frequency bands viz. 450-470 MHz or 2.5 GHz may be

considered. In case of inescapable requirement of Defence, then only 5+5 MHz may be considered in this band.

7.. The Govt' s own 5G High Level Forum for implementation of 5G has also recommended 700 MHz for 5G deployment

8. Hence, it is imperative that each of the 4 Telecom Service Providers (including the Govt. Operator BSNL/MTNL) must be provided at least 10Mhz paired spectrum (10+10) Mhz. to make effective use of the band for delivering 5G. Given this scenario, the total spectrum required will be 40+40 MHz, thereby leaving 5+5 MHz paired spectrum available for alternate use. This remaining portion of the band may be provided to Defence instead of the assigned 10MHz paired spectrum (10+10) MHz. If the same is found inadequate, it is requested that Defence be requested to shift to an alternate band

9. GSM-Railway is a wireless communications standard for railway communication and applications. It is based on European standards of European Rail Traffic Management System (ERTMS). GSM-R is built on GSM technology, and benefits from the economies of scale of its GSM technology. GSM-R is a secure platform for voice and data communication between railway operational staff, including drivers, dispatchers, shunting team members, train engineers, and station controllers. It delivers features such as group calls (VGCS), voice broadcast (VBS), location-based connections, and call pre-emption in case of an emergency. This will support applications such as cargo tracking, and passenger information services. According to the GSM-R industry, GSM-R will be supported until 2025-2030. In view of the above, it is proposed that Railways should continue to deploy GSM-R based Radiocommunication Systems for Public Safety and Security till such time that a new alternate proven technology in a globally harmonised spectrum band for Railways is identified by WRC-19 of ITU and then subsequently cost effective solutions are deployed in other Railway administrations

**10..** Given the fact that this requirement of the Railways is for the purpose of Public Safety & Security, no untested or unproven spectrum band should be allocated for this purpose. While GSM-R is globally proven technology, the emerging technologies for Next Generation RSTT are still yet to be proven. We understand that Global Spectrum Band harmonisation for emerging technologies for RSTT has not been completed yet and is likely to take some direction, post conclusion of WRC -19 (Agenda Item 1.11). Also the proposed band is required to be harmonised with the development initiatives from the railways signaling community which is working to introduce ETCS LEVEL 2 in the Indian Railway network.

In view of the above, we once again reiterate that NO SPECTRUM in 700Mhz band should be assigned nor reserved for Railways. In fact, it would be more prudent for IR to wait for the outcome of WRC-19 for global harmonisation of the bands(s) for Future Mobile Communication Systems for Railways and wait thereafter for subsequently cost effective solutions to be deployed by other Railway administrations and proven & cost-effective equipments to be made available in these chosen bands before being adopted in India.

**Q.2 In case your answer to Q1 is in affirmative, how much spectrum should be assigned to Indian Railways?**

**BIF Response**

Not Applicable. As mentioned in response to Q1 above, BIF feels that spectrum in the 700 MHz band should not be considered for RSTT.

**Q.3 In case your answer to Q1 is negative, i) what are the other bands (including 450-470 MHz) in which spectrum can be assigned for RSTT, ii) how much spectrum should be assigned to Indian Railways?**

**BIF Response**

We once again reiterate that the correct approach would be to wait for the outcome of WRC-19 of ITU for regional or global harmonization of the bands(s) for RSTT. It may be prudent to wait for the spectrum bands to be chosen for global harmonisation. Also the chosen band is required to be harmonised with the development initiatives from the railways signaling community which is working to introduce ETCS LEVEL 2 in the Indian Railway network.

**Q.4 In case it is decided that spectrum in IMT bands which have already been earmarked for mobile services, be assigned to Indian Railways for RSTT in India, what should be the methodology (including price) of allotment of spectrum?**

**BIF Response**

We once again strongly recommend bands already considered for IMT 2020 viz. 700Mhz band should not be reserved/ assigned to Railways, as mentioned in Response to Q1 above. We need precious 700MHz band to cater to the growing data needs of Digital India. We are a high population and a highly dense country unlike other countries and need this precious spectrum band to cater to the growing coverage and capacity needs of broadband penetration across the country.

In the unlikely event that some part of the IMT band is assigned to IR, they must either participate in the auction or be asked to match the auction price

**Q.5 In case it is decided to assign spectrum in other spectrum bands (including 450-470 MHz band), what should be the methodology (including price) of allotment of spectrum?**

**BIF Response**

We once again reiterate that the correct approach would be to wait for the outcome of WRC-19 of ITU for regional or global harmonization of the bands(s) for RSTT. It may be prudent to wait for the spectrum bands to be chosen for global harmonisation.

In case IMT band, is allocated, then IR maybe asked to either participate in the auction or be asked to match the auction price. If in case the auction price is not available in some band, then the nearest band price may be taken. For example, in case of 450Mhz band, the nearest band price that must be selected is the 700Mhz for which price is available. In case the 450 MHz is auctioned in future, then any difference in price (between the 450 MHz & 700 MHz) must be paid later.

**Q.6 Do you foresee any challenges, if IR makes internet services available onboard i.e. within the train using spectrum allocated for signaling purpose?**

**BIF Response**

Already several IFMC License Service Providers are available who are licensed to provide these services over air, water & land. It is preferred that IR use the services of these commercial operators instead of trying to do everything themselves

However, in case they decide to provide the services by themselves, then they must obtain the license by paying the requisite License Fees and also purchase the requisite spectrum through auction or must match the auction price. If in case the auction price is not available in some band, then the nearest band price may be taken. For example, in case of 450Mhz band, the nearest band price that must be selected is the 700Mhz for which price is available. In case the 450 MHz is auctioned in future, then any difference in price (between the 450 MHz & 700 MHz) must be paid later.

Railways can consider providing internet after taking necessary ISP license from DOT within the assigned spectrum but in that scenario, Railways have to pay the spectrum fee at the rate of auction value paid by TSPs for same amount of spectrum.

**Q.7 Whether the requirement of IR for RSTT can be fulfilled using the following alternate methods: i) Alternate method suggested in para 4.47, wherein a TSP could build, deploy and maintain LTE-R network for IR; while the control, use and operation of the LTE-R network may be with IR. OR ii) Alternate method suggested in para 4.48, wherein there could be a common integrated network (with common spectrum) for Public Safety i.e. Public Protection and Disaster Relief (PPDR) and Railways, using PS-LTE and LTE-R technology respectively. OR iii) Any other method as may be suggested by the stakeholders. (Please provide detailed response with justifications and required enabling provisions.)**

**BIF Response**

Alternate Method i) suggests that one could get the LTE-R based network built and deployed through one of the existing TSPs who may have acquired spectrum in the 700 MHz band. In this case, the TSP will build the network for IR along the railway track for ETCS Level 2 based on LTE-R standards and at the same time utilize the same frequencies for its commercial operation elsewhere. This will take care of the effective utilization of the spectrum and state of art LTE-R network for IR. The control, use and operation of the LTE-R may be with IR only whereas the maintenance and SLA could be maintained by the concerned TSP.

Method suggested above in Para 4.47 may not be acceptable to Railways as they have to bear a proportional part of the cost of the assigned /used spectrum besides spectrum usage charge annually, while they may be interested in allocation of free spectrum as it relates to public safety.

Alternate Method ii) suggests that we could have an integrated network for Public Safety i.e. Public Protection and Disaster Relief (PPDR) and Railways, though it must be clearly mentioned that this is not a proven solution and not implemented anywhere as per the requirement of our Railways which needs a cost effective and proven solution in an established and globally harmonised spectrum band with implementation of ETCS Level 2 Signaling along with quad play LTE-R based solution working in Railway networks for a few years.

As per Method ii), PPDR and Railways, both have the requirement of a robust communication system. Since requirement of Railways is limited to the rail network, it could be possible that a common network is put in place which can be used both for PPDR as well as for providing Public Safety & Security Services in the Railways. TRAI in its recommendations on “ “Next Generation Public Protection and Disaster Relief (PPDR) communication networks” has also recommended that Government

should set up Pan-India integrated Broadband PPDR (BB-PPDR) Communication Network (to be called “National BB-PPDR Network” ) based on 3GPP PS-LTE technology, 2x10 MHz of dedicated spectrum should be allocated nationwide to the Special Purpose Vehicle (SPV) under Ministry of Home Affairs (MHA) on no-cost basis for LTE based broadband PPDR networks, 814-824/859-869 MHz should be assigned for nationwide BB-PPDR services.

From the above, it can be seen that TRAI has recommended that 10 MHz (paired) spectrum in 800 MHz spectrum band be allocated for nationwide PPDR network. This 10 MHz (paired) spectrum could be used for both PPDR as well as for Railway communication. A single TSP may deploy integrated network using 10 MHz (paired) spectrum having PS-LTE deployment for PPDR agencies and LTE-R deployment for Indian Railways. This will require coordination and Standard Operating Procedures (SOP) between Ministry of Home Affairs and Indian Railways. For this to be enabled, RAN Sharing, resource allocation rules and standard interworking procedures needs to be in place.

In view of the merits of cost and resource optimisation including spectrum requirements in Alternate Method ii), we feel that this may be a more viable option, though this method will have its implementation challenges as it is required to roll out a nation-wide network on the scale of Bharat Net.

**Q.8 If there are any other issues/suggestions relevant to the subject, stakeholders may submit the same with proper explanation and justification**

**BIF Response**

NIL