

BIF response to TRAI CP on Spectrum Requirements of National Capital Region Transport Corporation (NCRTC) for Train Control System for RRTS Corridors

Q1. In which band, spectrum should be assigned to NCRTC for their LTE-R technology based Train control system for RRTS rail corridors?

BIF RESPONSE

NCRTC requires a contiguous 5 MHz band for running Mission critical operations of high-speed trains using ETCS 2 & 3 European standard for high speed corridors which is much higher sensitive, efficient and secure system than even Indian railways has planned. Also, the use cases for NCRTC includes signalling, Group communication Location based Services, Real-time video surveillance and IoT devices for operation and maintenance services. A minimum contiguous 5 MHz bandwidth is required to perform all such operations. In view of the criticality of train operations and public safety, efficient non-interfering bandwidth would be advisable to be used, like Indian Railways.

The Spectrum Band may preferably be in the sub GHz bands and must be contiguous to operate LTE as a bearer. The Band can be shared with other regional transport systems using MOCN to mitigate any interference. It may be noted that LTE-R includes specifically designed algorithms to deliver superior Quality of Services at highest train speeds in this band.

Q2. How much spectrum in the spectrum band(s) suggested in response to Q1, should be assigned to NCRTC to meet its requirement for its RRTS LTE-R based network?

BIF RESPONSE

Based on the response to Q1 above, it is suggested to use the minimum 5 MHz bandwidth for such Mission critical operations as explained in Q1. The Spectrum Band may preferably be in the sub GHz bands and must be contiguous to operate LTE as a bearer. The Band can be shared with other regional transport systems using MOCN to mitigate any interference.

Q3. Do you see any challenge, if the same spectrum is assigned to different RRTS/metro rail networks, operating in geographically separated areas/corridors in the country? If yes, kindly provide details and possible solutions.

BIF RESPONSE

No challenge is anticipated as they would be non-interfering with each other, being in different geographically separated areas and corridors of the country. TRAI, in its Recommendations on 'Allotment of spectrum to Indian Railways for Public Safety and Security services', dated 25th October 2019, had already recommended that since IR would be using the assigned spectrum along its railway track network and stations only, DoT may explore the possibility of assigning the same spectrum in other areas for area specific limited use to other entities for captive use on a non-interference basis.

Q4. In case more than one RRTS Metro/rail networks are to operate in overlapping geographical areas, will it be appropriate for RRTS Metro/rail networks to share the Radio Access Network (RAN) in the overlapping areas using MultiOperator Core Network (MOCN)? Any other feasible mechanism for using same spectrum in overlapping areas may also be suggested with detailed explanation. Kindly justify your response.

BIF RESPONSE

Yes – In case more than one RRTS Metro/rail networks are to operate on same spectrum frequencies in overlapping geographical areas, the RRTS Metro/rail networks may share the Radio Access Network (RAN) in the overlapping area, which is known as Multi-Operator Core Network (MOCN). Active Infrastructure sharing using MOCN should be encouraged to help reduce network costs, spectrum sharing and better spectrum utilisation.

In case, it is decided that RRTS Metro/rail networks may share the Radio Access Network (RAN) in the overlapping area using Multi-Operator Core Network (MOCN), to take care of a future situation, where another RRTS/Metro rail network may come up in the overlapping geographical area, while assigning the spectrum, it may be clearly mentioned that the same spectrum may be assigned to other RRTS/Metro rail networks in the same geographical area on sharing basis. Further, in MOCN, two or more RRTS/Metro rail networks may share the RAN in the overlapping geographical area, which will be connected to their individual core networks. If one RRTS/Metro rail RAN has already been deployed and another RRTS/metro rail network is assigned spectrum in overlapping area on sharing basis, it needs to be explored that what could be the practical difficulties and possible solutions for sharing of RAN.

Q5. In case it is decided that RRTS Metro/rail networks may share the Radio Access Network (RAN) in the overlapping area using Multi-Operator Core Network (MOCN), a) Whether it should be included in the terms and conditions for assignment of spectrum that the assigned spectrum may have to be shared with other RRTS/Metro rail networks to whom government decides to assign the same spectrum frequencies on sharing basis? b) Whether certain guidelines for coordination mechanism need to be issued or it should be left to the mutual agreement between the RRTS/Metro rail network operators mandated for MOCN RAN sharing? In case, guidelines need to be prescribed, kindly suggest the points to be included in the guidelines. c) Whether commercial arrangements between two RRTS/Metro rail networks for RAN sharing needs to be regulated or left to the mutual arrangement? d) Whether any other conditions need to be prescribed for such RAN sharing? Kindly provide detailed justifications.

BIF RESPONSE

(a): Yes

(b): Coordination should be best left to the RRTS/Metro Rail Network Operators to be sorted out amongst themselves under some overarching principles/guidelines to be laid down by the Regulator/Licensor

(c): Commercial arrangements should be best left to the RRTS/Metro Rail Network Operators

(d): RAN Sharing agreements should be best left to the operators themselves

Q6. What should be the permission/licensing regime for operation of wireless networks for NCRTC and other RRTS/metro rail networks? Kindly justify your response with justification.

BIF RESPONSE

Since they would be using licensed spectrum, they should be required to take an appropriate license under Indian Telegraph Act 1885. However, spectrum maybe allocated administratively as was done in the case of IR.

TRAI, in its recent recommendations on 'Auction of Spectrum in frequency bands identified for IMT/5G' dated 11th April 2022, under the Chapter on Spectrum for Private Cellular Networks has, inter-alia, recommended that: "...for establishing isolated captive wireless private network using licensed IMT spectrum, the entity/enterprise should be provided a Permission/license under Section 4 of the Indian Telegraph Act, 1885.

The permission/license may be named as 'Captive Wireless Private Network (CWPN) permission/License'". Therefore, CWPN Permission/License be made applicable for NCRTC and other RRTS/metro rail networks also. However, the Permission/Licensing regime for Captive Wireless Networks for Train Signalling System may be kept very simple and light touch.

Q7. What should be the broad terms and conditions, which may be included in the Permission/License. Kindly provide detailed response with justification.

BIF RESPONSE

It should be similar to what has been recommended by TRAI in its recent recommendations on 'Auction of Spectrum in frequency bands identified for IMT/5G' dated 11th April 2022. Under the Chapter on Spectrum for Private Cellular Networks, TRAI has, inter-alia, recommended that: "...for establishing isolated captive wireless private network using licensed IMT spectrum, the entity/enterprise should be provided a Permission/license under Section 4 of the Indian Telegraph Act, 1885. The permission/license may be named as 'Captive Wireless Private Network (CWPN) permission/License'".

Q8. Would it be appropriate if the spectrum be allocated on the same analogy as Indian Railways, for the same reasons as argued by DoT? If not, what should be the spectrum charging mechanism for spectrum that will be assigned to NCRTC? Kindly provide detailed response with justification.

BIF RESPONSE

Yes. The spectrum maybe allocated administratively and charged using formula based charging as prescribed by DoT for Royalty Charges and License Fee for captive networks, on the same lines as in the case of allocation of spectrum in the 700 MHz band for IR.

Q9. Whether the terms & conditions and spectrum charges that will be applicable for NCRTC, should be made applicable to the other RRTS/Metro rail networks that may come up in future? If no, what terms & conditions and spectrum charges should be made applicable for the other RRTS/Metro rail networks? Kindly justify your response.

BIF RESPONSE

Yes. All future RRTS/Metro Rail Networks must be subject to the same Terms & Conditions as is made applicable to NCRTC.

Q10. Any other issues/suggestions relevant to the subject, may be submitted with proper explanation and justification.

BIF RESPONSE

No Comments