CMRL COMMENTS ON ISSUES MENTIONED IN THE TRAI CONSULTATION PAPER

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

   Since already 5Mhz Paired spectrum is allotted in 700 Mhz band for IR, allocations of similar paired spectrum for other Metros and NCRTC will be ideal as it will reduce cost of assets for Railway applications as similar critical applications are run in all the Rail transport sector and the know how can be shared among them being in the same industry.

2. **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?**

   Critical data Applications are used for Metro transport such as Automatic Train operations, Driverless operation and Emergency communications between Train passengers and Central control, Live images from inside the trains to Central control which are mission critical. A min. of 5 MHz spectrum in 700 MHz band should be considered for allocation to Metro Railways.

3. **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.**

   No challenge is seen.

4. **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 Multi-Operator 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.**

   Since the locations where such overlap occurs are very few, an additional 5 MHz spectrum to the 5 MHz spectrum already allocated to IR can be allotted. It is suggested that instead of allocating heterogeneous 5 MHz bands , a 10 MHz homogeneous band be allocated for Indian Railways /Metro Applications/ RRTS.

   Such locations can be handled with minimal coordination in system design to prevent interference at converging and parallel locations between the concerned organisations and homogeneous spectrum can be used more effectively/efficiently by the individual Rail networks (IR /RRTS/Metro).

   In addition, if the interference mitigation steps are not effective, MOCN a proven technology for RAN Sharing in Public can also be considered for use.

5   **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?**
   It can 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 , in overlapping / converging areas , to whom government decides to assign the same spectrum frequencies on sharing basis. Additional measures to prevent interference can also be specified.

   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.**
   Basic guidelines can be issued by TRAI. The finer details of coordination can be left to the network operators.

   c) **Whether commercial arrangements between two RRTS/Metro rail networks for RAN sharing needs to be regulated or left to the mutual arrangement?**
   Broad guidelines can be issued by TRAI on RAN Sharing in overlapping area using MOCN.

   d) **Whether any other conditions need to be prescribed for such RAN sharing? Kindly provide detailed justifications.**
   In case of disagreement between two entities , MoHUA (Nodal Ministry for RRTS & Metro Rail) and IR may govern the terms and conditions of RAN sharing between two entities if it involves IR , otherwise MOHUA can govern the terms and conditions.

6 **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.**

   The same policy as adopted for Indian Railways for permission/licensing can be made applicable to Metros.

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

    Same terms and conditions as adopted for Indian Railways can be made applicable for Metro Rails.

8   **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.**

    Since both IR and METRO are using the spectrum for critical application of carrying the passengers safely, the same methodology can be adopted for Metros and Railways.

9   **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.**

    The same terms and conditions and spectrum charges can be made applicable.

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

    No suggestions