ಬೆಂಗಳೂರು ಮೆಟ್ರೋ ರೈಲ್ ನಿಗಮ ನಿಯಮಿತ
(ಸಹಭಾಗಿತ್ವದ – ಕರ್ನಾಟಕ ಸರ್ಕಾರ ಹಾಗೂ ಕೇಂದ್ರ ಸರ್ಕಾರ ಉದ್ಯಮ)
ನೊಂದಾಯಿತ ಕಚೇರಿ : ಬಿ.ಎಂ.ಟಿ.ಸಿ. ಕಾಂಪ್ಲೆಕ್ಸ್, 3ನೇ ಮಹಡಿ, ಕೆಂಗಲ್ ಹನುಮಂತಯ್ಯ ರಸ್ತೆ, ಶಾಂತಿನಗರ
ಬೆಂಗಳೂರು – 560 027, ಭಾರತ

Bangalore Metro Rail Corporation Ltd.
(A Joint Venture of Government of Karnataka & Government of India)
Regd. Office : B.M.T.C. Complex, 3rd Floor, K.H. Road, Shanthinagar,
Bangalore - 560 027. INDIA

BMRCL/CST/0006/MoHUA/Vol.II/2020 / 5530

15th July, 2022

To,
Shri Sunil Kumar,
Under Secretary to GoI,
Ministry of Housing & Urban Affairs (MRTS-I),
Urban Transport Division,
322-C, Nirman Bhavan, New Delhi-110011.

Dear Sir,

Sub: - Allotment of frequency spectrum to NCRTC for implementation of Train Control System for Regional Rapid Transit System – reg.

Ref: (i) MoHUA Letter No. K-14011/7/2018-MRTS-I, Dated: 30th June 2022
(ii) TRAI Letter No. C-15/2/(2)/2021-NSL-II, Dated: 23rd June 2022

BMRCL comments are sought regarding "Allotment of frequency spectrum to NCRTC for implementation of Train Control System for Regional Rapid Transit System" vide letters under reference.

Please find the enclosed comments to the questions raised in the consultation paper issued by TRAI.

Yours faithfully,

(N M Dhoke)
Director (RSE, O&M)

Encl: As above

Copy to: -

Shri Syed Tausif Abbas,
Adviser (Networks, Spectrum and Licensing),
TRAI.

Bangalore Metro Rail Corporation Ltd. comments on the TRAI Consultation Paper on Spectrum Requirements of NCRTC		
CHAPTER- III: ISSUES FOR CONSULTATION		
Sl.No	**Questions**	**BMRCL Comments**
1	In which band, spectrum should be assigned to NCRTC for their LTE-R technology based Train control system for RRTS rail corridors?	It is recommended to allot frequency band in 700 MHz spectrum. This is suitable considering the coverage distance and the band width required.
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?	Spectrum band of 10 MHz is proposed. This optimizes the hardware for the projected band width.
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. However, Indian Railways spectrum shall be separate from RRTS/Metro, as IR is covering almost all the geographical area.
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.	MOCN is considered appropriate for overlapping areas. Administrative guidelines shall be laid down by suitable authority.
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?	Yes.
	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.	Guidelines shall be issued covering QoS, Responsibility of maintaining the sites, Cost sharing.
	c) Whether commercial arrangements between two RRTS/Metro rail networks for RAN sharing needs to be regulated or left to the mutual arrangement?	Commercial arrangements shall be regulated with clear pricing.
	d) Whether any other conditions need to be prescribed for such RAN sharing? Kindly provide detailed justifications.	NIL
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.	Similar licensing procedure followed by DoT for other captive licenses like TETRA. However, license and royalty fees may be reviewed for government organizations providing public transport.

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7	What should be the broad terms and conditions, which may be included in the Permission/License. Kindly provide detailed response with justification.	Terms and Conditions of captive licenses like TETRA are suitable for LTE also. However, consideration for spectrum allotment shall be done based on bandwidth requirement and coverage distance. In TETRA, utilization of spectrum and user base is considered, making it difficult to get the required licenses from coverage and bandwidth point of view.
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.	Yes.
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.	Yes. Spectrum charges shall be standardized similar to TETRA. However, the pricing may be reviewed for government organizations providing public transport.
10	Any other issues/suggestions relevant to the subject, may be submitted with proper explanation and justification.	BMRCL currently uses the following technologies: - 1. Train Radio: - TETRA in the band of 380-420 MHz 2. Train Positioning Information: - Audio Frequency Track Circuit (AFTC) (or) Communication Based Train Control System using 2.4 GHz/5 GHz spectrum. 3. Train Remote: - This feature is not implemented in BMRCL. If considered for implementation, 2.4 GHz/5GHz band is suitable. 4. Train Surveillance: - Implemented using 2.4 GHz/5 GHz spectrum. The current technologies being used are serving the purpose and BMRCL is not foreseeing the immediate operational requirement for LTE.

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(P S Subramanyam)
Chief Engineer (S&T)
Bangalore Metro Rail Corporation Ltd.