



DIGITAL
LIFE

RJIL/TRAI/2022-23/143
14th July 2022

To,

Advisor (NSL)
Telecom Regulatory Authority of India
Mahanagar Doorsanchar Bhawan
Jawaharlal Nehru Marg, New Delhi 110002

Subject: RJIL's Comments on TRAI's Consultation Paper dated 09th June 2022 on "Spectrum Requirements of National Capital Region Transport Corporation (NCRTC) for Train Control System for RRTS Corridors".

Dear Sir,

Please find attached comments of Reliance Jio Infocomm Limited on the consultation paper dated 09.06.2022 on "Spectrum Requirements of National Capital Region Transport Corporation (NCRTC) for Train Control System for RRTS Corridors".

We hope that our submission will merit your kind consideration.

Thanking you,

Yours Sincerely,
For **Reliance Jio Infocomm Limited**

Kapoor Singh Guliani
Authorized Signatory

Enclosure: As above

Reliance Jio Infocomm Limited, CIN: U72900GJ2007PLC105869

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**Reliance Jio Infocomm Limited's comments on TRAI's Consultation Paper on
"Spectrum Requirements of National Capital Region Transport Corporation (NCRTC) for
Train Control System for RRTS Corridors" dated 9th June 2022.**

Preface:

1. Reliance Jio Infocomm Limited (RJIL) thanks the Authority for issuing this consultation paper to deliberate on the allotment of spectrum to **National Capital Region Transport Corporation (NCRTC) for Train Control System for RRTS Corridors.**
2. At the outset, we submit that there is no doubt that suitable spectrum is required for setting up communication corridor along the network of Indian Railways and other regional and suburban railway networks. The evolving technology and the requirements of passenger safety, track-side communication, train and way-side telemetry, video surveillance etc. requires that these networks should be LTE based to deliver optimum services. However, it is imperative that this spectrum is chosen post considering all relevant factors.
3. We submit that the digital dividend spectrum in 700 MHz band has immense potential for coverage in wide and rural areas and should be reserved for IMT and 5G services in the country and regular and ad-hoc demands of Government entities and Public Sector Units for spectrum **should be explored within the already allocated 5 MHz spectrum to Indian Railways and other non-IMT bands.**
4. We submit that in the current instance, NCRTC demand has emanated from lack of coordination between Indian Railways and NCRTC, **as the initial requirement was to build a network for RRTS corridors using the 5 MHz spectrum already allocated to Indian Railways.** Therefore, it is important that instead of exploring the possibility of allocating additional 5 MHz spectrum, the **Department of Telecommunications (DoT) should ask the parties to explore a way to share the spectrum. This should not be a difficulty as an expert body report certifying lack of interference risk is already in place.**
5. We reiterate our submission to the Consultation Paper on "Allotment of spectrum to Indian railways for public safety and security service" dated 24th June 2019 and submit that digital dividend spectrum in 700 MHz band, with a rapidly increasing device ecosystem, is a vital IMT band and is being considered for deployment to enable better coverage of rural areas. This spectrum is being auctioned in U.S. and many other countries for a while now, Asia Pacific Telecommunity (APT) and many Latin American and African countries have also adopted the FDD 700 MHz band plan for this spectrum.

6. **In addition to its usage in coverage under 4G technologies, this band has an important role to play in deployment 5G new radio (NR) as wide-area coverage layer.** We understand that this spectrum will be used extensively across the world to deliver '5G everywhere'. **It is well recognized that the intermix of sub-GHz spectrum frequencies with spectrum in C-Band and mmWave spectrum will help us deliver faster and cost-efficient 5G services.**
7. Evidently, the vast commercial potential of **spectrum 700 MHz band is undeniable and recognized by both the Authority and DoT.** Therefore, it is needless to add that such valuable spectrum resource should be allocated very cautiously, especially when alternatives are available as well as feasible.
8. The Authority is also aware that India's aspirations to transform the entire country and all aspects of social and commercial life with digital services relying on a strong wireless broadband backbone implies that all possible IMT spectrum is made available for TSPs. There is a plethora of international studies, including some by GSMA, indicating the India's spectrum requirements are going to increase substantially as more and more subscribers are added to high speed broadband networks, therefore it is imperative that the IMT spectrum is kept reserved to meet the upcoming explosive data and enhanced capacity requirements, irrespective of uptake of a particular band in an auction or two.
9. We submit that the already allocated spectrum in 700 MHz band for Indian Railways with the newest technology provides sufficient capacity for all Railway based connectivity networks and should be sufficient to meet all current and future requirements, **especially considering that so far these requirements were being met by 1.4-1.6 MHz of spectrum in 900 MHz band using GSM technology. We believe that catering to each and every spectrum demand by administratively allocating spectrum in 700 MHz band would be very inefficient way to use this spectrum of immense commercial value.**
10. Already Railway's limited requirement of spectrum along the tracks has rendered 5 MHz of this spectrum unusable commercially as Railways pass through populated areas as well and allocating the same spectrum to any TSP in non-Railways areas will lead to interference issues impacting the provision of RSTT, thus the spectrum allocated to Railways cannot be used for any other purpose anywhere. **Therefore, no more spectrum in this 700 MHz band should be allocated for any other type of captive use by any Government/non-Government agency.**
11. We further submit that while we agree that Railways and NCRTC requirements to provide mission critical passenger safety services & applications and video analytics

for passenger security and way side telemetry through Mobile communications are valid and legitimate requirements, we strongly believe that the same can be met through already allocated 5 MHz spectrum in 700 MHz band. **We further submit that the Authority has already suggested possibilities of Radio Access Network (RAN) sharing to manage the spectrum requirements in overlapping geographical regions. We submit that in addition to very feasible option of RAN sharing, the option of spectrum sharing, and network slicing can be used for such contiguous geographical regions.**

12. The Railways and NCRTC are commercial organisation and while building communication networks, **these entities should acquire Unified License under suitable authorization for they should compensate the Exchequer, suitably at commercial rates for using this spectrum in 700 MHz band. Further, as per allocation to Railways, the NCRTC should not be permitted to offer commercial services like Wi-Fi, voice. Video etc. onboard to its customers.**

13. We further understand from the DoT's reference and this consultation process that this issue is not pre-decided and post the consultative exercise, DoT will add the 5 MHz spectrum in 700 MHz withheld from auction, in the auction being held July 2022 and forthcoming auctions. Furthermore, as the efficient management of available spectrum is one of Authority's primary functions under the terms of clause 11 (1)(a) of TRAI Act, 1997 as amended by TRAI Amendment Act 2000, we request the Authority to ensure that commercially sensitive spectrum in 700 MHz band is utilized in an optimum manner.

14. To summarise, we submit as under:

- 1. The spectrum in 700 MHz band already allocated to Indian Railways should be used for NCRTC requirements.**
- 2. There should be no further fragmentation of 700 MHz spectrum and the 5 MHz spectrum withheld should be added in auction pool.**
- 3. The inter-departmental issues like between Indian Railways and NRCTC should be resolved internally without demand of new spectrum. The 5G features like RAN sharing, Spectrum sharing, and network slicing should be used for using the same spectrum in geographically overlapping areas.**
- 4. The entities using administratively allocated spectrum should not be permitted to offer commercial services like Wi-Fi and voice, video communication etc.**
- 5. Indian Railways and NCTRC should obtain suitable Unified License Authorization to maintain and operate communication networks and adequately compensate the exchequer for use of spectrum.**

Issue wise response:

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

and

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?

RJIL Response:

1. We submit that as already **5 MHz spectrum in 700 MHz band has been assigned to Indian Railways for similar purpose, there is no need for a separate spectrum assignment for NCRTC for their LRE-R technology-based Train control system for RRTS rail corridors, and NCRTC requirements should be met from the already assigned spectrum to Indian Railways.**
2. The details of interaction between the entities and the expert report provided by the NCRTC, makes it evident that **there is no requirement for a separate spectrum assignment and even the respective Authorities were clear on using the same spectrum, however, the delays in inter-departmental co-ordination has prompted this demand by NCRTC, especially considering the deadline to launch their services.**
3. Notwithstanding the urgency of NCRTC, **it is pertinent to remember that spectrum allocation and subsequent network developments are not ad-hoc arrangements and need to be done with a long-term plan and objectives. Consequently, the Authority should encourage the DoT to resolve the issue between the entities instead of fragmenting this commercially important spectrum to meet such demands.**

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.

RJIL Response:

1. We submit that one of the prime objectives of spectrum allocation is to ensure its optimum utilization. **This makes it incumbent on the spectrum management Authorities to ensure that same spectrum is allocated to different entities, wherever technically feasible, in geographically separated areas and this practice is already been followed in allocation of spectrum to TSPs and other Government entities.**

2. As the Government has already allocated 5 MHz of valuable spectrum in 700 MHz band to Indian Railways for Railway Radiocommunication Systems between Train and Trackside (RSTT) for exclusive use alongside the railways tracks, it is critical to optimally utilize this spectrum in the locations where Railways is not using the same.
3. Evidently, considering the length and breadth of Indian Railways, **this spectrum will not be usable for commercial networks across the country. Therefore, it is important that this spectrum be used on for other Government captive and non-commercial use cases.** Needless to add that once this spectrum has become unusable for commercial purposes across India, its optimum utilization can only be derived from parallel allocation to different entities in geographically separated areas and corridors. Further, even in geographically overlapping areas this same spectrum can be used by leveraging RAN sharing and other suitable options, as explained in subsequent response.
4. Therefore, same spectrum should be used for different RRTS/metro rail networks, operating in geographically separated areas/corridors in the country as well as in geographically overlapping areas.

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 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.

RJIL Response:

1. Considering the diverse rail-based transport solutions being adopted in the country like **Regional Rapid Transit System (RRTS), Metro, Monorail, Trams and other types of suburban railways, besides the behemoth of Indian Railways, it is inevitable that these systems will overlap geographically, leading to the need for prior planning for efficient working of communication systems using same spectrum.**
2. We submit Radio Access Network (RAN) sharing will be the most fruitful in such scenarios. **As noted by the Authority, RAN sharing or Multi-Operator Core Network (MOCN), under the 3GPP Release 8 is widely used solution to optimize the spectrum resources and also to avoid interference.**
3. Considering the current usage and capacity requirements for RSTT related activities, which have been so far met by using **GSM technology over 1.6 MHz of spectrum in 900 MHz band. The 5 MHz spectrum in 700 MHz band using LTE technology would be sufficient to meet the requirements of all the parallel railway systems in a geographical**

location. The 3GPP implementation of MOCN would ensure full availability of this enhanced bandwidth to multiple networks without interference.

4. Although there is minimal possibility of capacity crunch, **even this hypothetical scenario can be met by adding additional sector/cell in the section of potential interference. This will help optimal utilization of spectrum already allocated for Railways.**

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.**

RJIL Response:

The spectrum allocation to Railways and other Government entities or PSUs is being done on administrative level for societal purposes and consequently, they should not have an exclusive right to use the allotted spectrum. Further barring the increased efficiency for RSTT any other benefits, including commercial benefits are ruled out for the spectrum holders. In this context, our issue wise response is as below:

- a) **Inclusion of RAN sharing in terms and conditions:** We submit that the **RAN sharing should be mandatory for all spectrum allocated administratively to Government entities.** The terms and conditions for allocation of spectrum should clearly prescribe that in case of overlapping usage, the entities will be required to share RAN on non-discriminatory basis.
- b) **Guideline for Coordination-** We submit that the co-ordination should be left to mutual understanding between the entities, however, **in case of unnecessary delay beyond 30 days by any party, the other party should be entitled to approach WPC-DoT for resolving the impasse.**

- c) **Commercial arrangements:** The cost-based commercial arrangements should be left to mutual understanding between the parties. **In case of a disagreement, DoT should be the adjudicator.**
- d) **Other Conditions:** There is no need for extensive conditions considering the type of communication and networks between two RRT/Metro rail networks and the fact that these entities will be acquiring authorization under Unified License.

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.

RJIL Response:

We submit that all types of commercial/non-commercial, public/non-public communication services in the **country should be offered only under the Unified License framework and the Authority as well as Government should refrain from creating layers of licenses/permission, as the same is counterproductive to Unification of License.** Therefore, we submit that a new Chapter on **'Captive Wireless Networks for Train Signalling System'** should be introduced under Unified License.

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

RJIL Response:

We submit that as this license will be used to provide communication services on a captive network on a non-commercial basis, all the operation and security conditions applicable for Unified License with access services authorization should be applicable. Further, owing to the non-commercial and essentially machine-based usage, the subscriber related provisions can be removed, all other requirements levies should be applicable.

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.

RJIL Response:

1. We reiterate that **there is no need to allocate any additional spectrum. The DoT analogy of Indian Railways with NCRTC is accurate and should be considered in allocating same spectrum to NCRTC in its area of operation.**

2. Further, we feel that as the commercial spectrum is being allocated to Government entities without any cost, **it is imperative that the spectrum usage charges for this spectrum should be sufficient enough to compensate the exchequer for loss of revenue and appropriate formula should be derived for the same.**

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.

RJIL Response:

1. We once again reiterate that there is no need to allocate any additional spectrum and the 5MHz spectrum already allocated to Indian Railways should be used to meet such requirements of other bodies. **The requirements in geographically overlapping areas can be fulfilled by facilitating RAN sharing and spectrum sharing as mentioned in above responses.**
2. With regards the charging mechanism, we submit that there should be a uniform formula-based charging designed in a manner to compensate Exchequer for loss of not-auctioning the spectrum.

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

RJIL Response: None