भारतीय दूरसंचार विनियामक प्राधिकरण

Telecom Regulatory Authority of India

Recommendations on
Assignment of Additional Spectrum to Indian Railways for its Safety and Security Applications

(Response to the Back Reference Dated 16th June 2025
Received from DoT on the TRAI's Recommendations Dated 20th December 2024)

New Delhi, India
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CONTENTS

CHAPTER I: INTRODUCTION AND BACKGROUND

A. DoT's Reference Dated 26.07.2023

1.1 The Department of Telecommunications (DoT), Ministry of Communications, Government of India, through its letter No. L-14001/13/2023-IMT dated 26.07.2023 **(Annexure-I)**, sent a reference to the Telecom Regulatory Authority of India (hereinafter also referred to as "TRAI", or "the Authority") seeking recommendations on allotment of additional spectrum to Indian Railways for its safety and security applications in the 700 MHz band. The relevant extract of afore-mentioned letter dated 26.07.2023 is reproduced below:

"This is to inform that Indian Railways has requested for additional 5 MHz of paired spectrum in the 700 MHz band to be allocated free of cost for enhancing its safety and security systems (Annexure - I).

2. Based on an earlier request from Indian Railways, the recommendations of TRAI were sought in the matter and TRAI provided its recommendations on this subject on 25-10-2019.

2.1. Later, based on the approval of Cabinet, Indian Railways was assigned 5 MHz of paired spectrum in the 700 MHz band on 22-10-2021 (Annexure - II). IR was also intimated about the withdrawal of its GSM-R spectrum holding in the 900 MHz band in 14 LSAs, upon migration to LTE based network. The Indian Railways is yet to confirm the migration to the LTE based network.

3. Meanwhile, the request of National Capital Region Transport Corporation (NCRTC) for 5 MHz of paired spectrum in the 700 MHz was also considered in the Department. Subsequently, the TRAI recommendations were sought and based on the recommendations dated 28-12-2022, DoT provisionally assigned 5 MHz of paired spectrum to NCRTC and the roll out of the LTE network is under process. The assignment of spectrum to NCRTC shall be regularized after the approval of the Union Cabinet.

4. Recently, based on the request from BSNL, the Cabinet has approved the reserving of paired spectrum in 700 MHz band in lieu of the 10 MHz of paired spectrum already reserved in the 600 MHz band. After considering this request of BSNL, only 5 MHz of paired spectrum is presently available as vacant spectrum in the 700 MHz band. The present spectrum holding of the various TSPs/ users in the 700 MHz band is placed at Annexure-III.

5. Recently, the Indian Railways has sought additional 5 MHz of paired spectrum, free of cost, in the 700 MHz band citing the following points –

(i) IR's indigenous development of Radio based Train Collision Avoidance System (TCAS) Kavach became successful. Radio based TCAS shall be the IR's ATP instead of ETCS level 2. Hence It is requested that Railways be allotted additional 5 MHz spectrum for design optimization of the network, when IR implements LTE network in 700 MHz band for safety & security applications.

(ii) The recent Balasore incident has shown that for the purpose of safety, it is important to capture large scale data & videos from moving trains on a real time basis. Dumping at a stopping station, which has high-capacity WiFi, shall not serve the objective. Further, during exigencies, the TSP's network gets choked thereby adversely affecting the relief and restoration operations.

(iii) When Railways implements its LTE network & Kavach over LTE, it shall surrender frequencies in the 146-174 MHz presently being used for driver-guard & driver/ guard to station communication as well as in the 400 MHz band being used for Kavach and consolidate all its requirements in 700 MHz band provided adequate bandwidth is available.

(iv) Utilization of this spectrum by other users can be done provided the same does not cause any interference to the network of IR.

6. Further, as per the TRAI recommendations on assignment of spectrum to Indian Railways, 5 MHz of paired spectrum has been assigned to Indian Railways on administrative basis and spectrum charges are to be paid annually on the formula basis similar to other captive users. However, for NCRTC, TRAI has recommended to levy .5 times the Auction Determined Price based on the

area of LSA and on pro rata basis for the assignment of spectrum for a period of 10 years. Thus, the per km spectrum charges for NCRTC shall vary from LSA to LSA based on the Auction Determined Price (ADP), whereas for IR charges are fixed irrespective of the LSA. An indicative calculation sheet highlighting the difference in spectrum charging across each LSA is attached herewith (Annexure -IV).

6.1 From the above it is evident that spectrum charges for NCRTC is many fold greater than that of IR in the LSAs having more ADP, whereas in some LSAs where ADP is less and LSA area is more, spectrum charges for IR is many fold greater than that of NCRTC. Hence TRAI may be requested to recommend a uniform spectrum valuation and charging methodology considering similar usages in the same spectrum band.

7. In view of the above, TRAI is requested to examine and provide its recommendations on –

(i) the assignment of 5 MHz of additional spectrum to Indian Railways in view of its earlier recommendations dated 25-10-2019 and also in the context of its earlier recommendations with respect to NCRTC dated 28-12-2022 and auction of spectrum dated 11-04-2022.

(ii) While providing the recommendations, TRAI may also consider the possibility of sharing of the spectrum between IR/ NCRTC/ RRTS/ Metro and other similar networks to ensure the efficient utilization of spectrum.

(iii) Considering the different spectrum valuation methodology as recommended by TRAI for the 5 MHz of paired spectrum in the 700 MHz band, assigned to Indian Railways and for NCRTC, TRAI may examine and if found necessary recommend a uniform spectrum valuation and charging methodology considering similar usages in the same spectrum band.

(iv) Any other recommendations deemed fit for the purpose.

1.2 Hereinafter, the afore-mentioned letter will also be referred to as "the Reference dated 26.07.2023".

B. TRAI's Recommendations Dated 20.12.2024

1.3 With respect to the Reference dated 26.07.2023, the Authority, on 07.02.2024, issued a consultation paper on 'Assignment of Additional Spectrum to Indian Railways for its Safety and Security Applications' for soliciting comments of stakeholders on the issues related to assignment of additional 5 MHz (paired) spectrum in the 700 MHz band to Indian Railways, aspects related to sharing of spectrum among Indian Railways/ NCRTC/ RRTS/ Metro and other similar networks, and spectrum valuation and charging methodology. After a comprehensive consultation with stakeholders, the Authority, on 20.12.2024, sent its recommendations on 'Assignment of Additional Spectrum to Indian Railways for its Safety and Security Applications' (hereinafter also referred to as, "the Recommendations dated 20.12.2024") to DoT.

C. DoT's Back-reference Dated 16.06.2025

1.4 DoT, through its letter dated 16.06.2025 (**Annexure-II**) on the subject- 'Back reference on TRAI recommendations dated 20-12-2024 on "Assignment of Additional Spectrum to Indian Railways for its Safety and Security Applications"' (hereinafter, also referred to as "the Back-reference"), informed, *inter-alia*, as below:

"The undersigned is directed to refer TRAI Letter … dated 20-12-2024 vide which TRAI has provided their recommendations on "Assignment of Additional Spectrum to Indian Railways for its Safety and Security Applications". These recommendations have been considered by the Department and the following has been decided:

i. There is a need to seek reconsidered recommendations from TRAI in respect of some of the recommendations/ sub-sections of recommendations. Such recommendations/ sub-sections of recommendations and the issues involved therein are enclosed as Annexure-I.

ii. Rest of the recommendations are accepted.

2. In view of the above, TRAI is requested to provide reconsidered recommendations, in accordance with the provisions of Section 11 of the TRAI Act 1997, as amended in 2000, on the recommendations listed in Annexure-I."

1.5 In short, DoT has referred back some of the recommendations and has requested TRAI to provide its reconsidered recommendations in respect of such recommendations.

D. The Present Response

1.6 The Authority has carefully examined the views expressed by DoT in the Back-reference. Based on a conscientious analysis, the Authority has arrived at the present response to the Back-reference. This chapter provides an introduction and background to the subject. Chapter II provides the issue-wise response of the Authority to the Back-reference.

CHAPTER II: ISSUE-WISE RESPONSE TO THE BACK REFERENCE

2.1 This chapter provides the response of the Authority to the views expressed by DoT in the Back-reference in respect of the recommendations on which the Government has sought reconsidered recommendations from TRAI. Such recommendations have been presented sequentially, and descriptions thereon have been organized in the following manner:

(a) First, the text of the recommendation has been reproduced, in respect of which, the Government has requested TRAI to provide its reconsidered recommendations.

(b) Then, the views expressed by DoT in the Back-reference in respect of such recommendation have been reproduced.

(c) Thereafter, the response of the Authority has been provided.

2.2 **Recommendation No. 3.1(a):** *In addition to the already assigned 5 MHz (paired) frequency spectrum in the 700 MHz frequency band, an additional 5 MHz (paired) frequency spectrum in the 700 MHz frequency band should be assigned to Indian Railways for its safety and security applications along the railway tracks for captive use.*

2.3 **DoT's Views on the Recommendation No. 3.1(a):** *Indian Railways (IR) is yet to utilise the 5 MHz of paired spectrum already assigned to them in the 700 MHz. Since, IR has not yet deployed their network they have not shared the base station deployment details to arrive at the spectrum charges payable as per the formula-based charging. Hence, so far, they have not paid any spectrum charges for the already assigned 5 MHz spectrum in 700 MHz band.*

In view of the above, the Department is of the view that the Assignment of additional spectrum will be considered only on utilisation of the already assigned 5 MHz (paired) frequency spectrum in the 700 MHz frequency band and the assignment will be based on Auction Determined Price (ADP) on upfront payment of spectrum charges.

2.4 **Response of TRAI w.r.t. DoT's Views on the Recommendation No. 3.1(a):**

2.4.1 Before proceeding to examine the DoT's views on the Recommendation No. 3.1(a), it would be worthwhile to understand the context and rationale of the Recommendation No. 3.1(a). In this regard, the following points are noteworthy:

(a) Through the Reference dated 26.07.2023, DoT stated, *inter-alia*, that "*the Indian Railways (IR) has sought additional 5 MHz of paired spectrum free of cost in the 700 MHz band citing the following points:*

(i) IR's indigenous development of Radio based Train Collision Avoidance System (TCAS) Kavach became successful. Radio based TCAS shall be the IR's ATP instead of ETCS level 2. Hence it is requested that Railways be allotted additional 5 MHz spectrum for design optimization of the network, when IR implements LTE network in 700 MHz for safety and security applications.

(ii) The recent Balasore incident has shown that for the purpose of safety, it is important to capture large scale data & videos from moving trains on a real time basis. Dumping at a stopping station, which has high-capacity Wi-Fi, shall not serve the objective. Further, during exigencies, the TSP's network gets choked thereby adversely affecting the relief and restoration operations.

(iii) When Railways implements its LTE network & Kavach over LTE, it shall surrender frequencies in the 146-174 MHz presently being used for driver-guard & driver/ guard to station communication as well as in the 400 MHz band being used for Kavach and consolidate all its requirements in 700 MHz band provided adequate bandwidth is available.

(iv) *Utilization of this spectrum by other users can be done provided the same does not cause any interference to the network of IR."*

(b) In the above background, DoT, through the Reference dated 26.07.2023, requested TRAI to examine and provide its recommendations on, *inter-alia*, the assignment of 5 MHz of additional spectrum to Indian Railways.

(c) With respect to the Reference dated 26.07.2023, TRAI held discussions with the Indian Railways. During the discussions, the Indian Railways informed TRAI that it requires 10 MHz of paired spectrum in the 700 MHz band to cater to the updated data rate requirement as given below:

S. No.	Application	Bandwidth requirement in download	Bandwidth requirement in upload
1	KAVACH	100 Kbps	100 Kbps
2	MC PTT + Voice	660 + 1000 Kbps	660 + 1000 Kbps
3	IoT Services	2 Mbps	2 Mbps
4	Video Streaming	4 Mbps	50 Kbps
5	On Board Video Surveillance (minimum per Train) CCTV	200 Kbps	40 Mbps (8 x 25 = 200 x 200 = 40 Mbps)
6	Passenger information display system	100 Kbps	10 Kbps
7	EoTT & DPWCS	300 Kbps	300 Kbps
8	Data uses for other safety, security & train operations applications	4.7 Mbps	1.7 Mbps
	Total Requirement	**13.060 Mbps**	**45.820 Mbps**

(d) During the discussions, Indian Railways mentioned that for the purpose of safety, it is important to capture large scale data and videos from moving trains on a real time basis, for which, (a) dumping at a stopping station, which has high-capacity Wi-Fi, does not serve the objective and (b) during exigencies, networks of telecom service providers get choked thereby adversely affecting the relief and restoration operations. Indian

Railways asserted that it needs an additional 5 MHz spectrum in the 700 MHz band to serve the updated data rate requirement.

(e) With respect to the Reference dated 26.07.2023, the Authority issued a consultation paper on 'Assignment of Additional Spectrum to Indian Railways for its Safety and Security Applications' dated 07.02.2024 for seeking inputs of stakeholders on, *inter-alia*, the issues related to assignment of additional 5 MHz (paired) spectrum in the 700 MHz band to Indian Railways. Through the said consultation paper, the Authority solicited the inputs of stakeholders on, *inter-alia*, the following question:
"Q1. Whether an additional 5 MHz (paired) spectrum in the 700 MHz band should be assigned to Indian Railways (IR) in order to meet its requirement for safety and security applications? Kindly provide a detailed response with justification."

(f) Based on a comprehensive consultation with stakeholders, the Authority finalised its recommendations on 'Assignment of Additional Spectrum to Indian Railways for its Safety and Security Applications' dated 20.12.2024. In the recommendations, the Authority analysed the matter related to the Indian Railways' request for an additional 5 MHz of paired spectrum in the 700 MHz band in detail and made the following observations:

"2.21 As mentioned above, the updated uplink data rate requirement of Indian Railways is about 45 Mbps. It is noted that Indian Railways, in its comments, has mentioned that out of the total uplink data rate requirement of about 45 Mbps, only 3 Mbps will be served with the existing 5 MHz (paired) frequency spectrum, which will increase to 6.5 Mbps with 10 MHz (paired) frequency spectrum. Also, one of the stakeholders expressed the view that the throughput requirement of Indian Railways is significantly high for a 10 MHz network to deliver in practical.

2.22 The Authority examined the comments of stakeholders and is of the considered view that with assignment of additional 5 MHz (paired) frequency spectrum in 700 MHz band to Indian Railways, it will have a total of 10 MHz (paired) frequency spectrum in 700 MHz band, which may not be sufficient to fulfil the entire throughput requirement of Indian Railways, but will provide enough bandwidth such that the Indian Railways will be able to meet the entire critical data throughput requirement i.e. signalling system operation, MC PTT, safety and security features other than on-board video surveillance. As regards on-board video surveillance, Indian Railways may not be able to stream the live feed of all the coaches at all times but would be able to stream live feed of a limited number of coaches having security concerns or could send intermittent live feed on a coach-by-coach basis. In addition, Indian Railways could use other means such as using telecom service provider's mobile network to transmit residual on-board video surveillance data.

2.23 It is noteworthy that through the instant reference dated 26.07.2023, DoT has requested TRAI to provide recommendations on the assignment of additional 5 MHz of spectrum to Indian Railways. Therefore, the Authority has considered assignment of only 5 MHz of additional spectrum to Indian Railways. The Authority is of the view that Indian Railways may consider implementing AI-based solution to optimize their requirement as the availability of spectrum in 700 MHz band is limited."

(g) In light of the above observations, the Authority, through the Recommendation No. 3.1(a) of the Recommendations dated 20.12.2024, recommended as below:

"In addition to the already assigned 5 MHz (paired) frequency spectrum in the 700 MHz frequency band, an additional 5 MHz (paired) frequency spectrum in the 700 MHz frequency band should be assigned to Indian Railways for its safety and security applications along the railway tracks for captive use."

2.4.2 Based on the above description, it is clear that the Authority, through the Recommendation No. 3.1(a), recommended that an additional 5 MHz (paired) frequency spectrum in the 700 MHz band should be assigned to the Indian Railways so that the Indian Railways may meet at least its critical data throughput requirement i.e., signalling system operation, MC PTT and safety and security features other than on-board video surveillance.[1]

2.4.3 Having described the context and rationale of the Recommendation No. 3.1(a), the Authority proceeds to examine the DoT's views on the Recommendation No. 3.1(a).

2.4.4 With respect to the Recommendation No. 3.1(a), DoT has expressed the following views in the Back-reference:

(a) View#1: The assignment of additional spectrum will be considered only on utilization of the already assigned 5 MHz (paired) frequency spectrum in the 700 MHz frequency band.

(b) View#2: The assignment will be based on Auction Determined Price (ADP) on upfront payment of spectrum charges.

2.4.5 While the view#1 related to the assignment of the additional 5 MHz (paired) spectrum is being dealt with in this section, the view#2 related to the pricing of spectrum will be dealt with in detail in response to the DoT's view on the Recommendation No. 3.6 below.

2.4.6 In the Back-reference, DoT observed that "*Indian Railways (IR) is yet to utilise the 5 MHz of paired spectrum in the 700 MHz.*". Based on this observation, DoT expressed its view that "*the Assignment of additional spectrum will be*

[1] In respect of the requirement of on-board video surveillance, the Authority had expressed a view that with a total of 10 MHz of paired spectrum, Indian Railways may not be able to stream the live feed of all the coaches at all times but would be able to stream live feed of a limited number of coaches having security concerns or could send intermittent live feed on a coach-by-coach basis.)

considered only on utilization of the already assigned 5 MHz (paired) frequency spectrum in the 700 MHz frequency band".

2.4.7 While examining the DoT's views on the Recommendation No. 3.1(a), the Authority took note of the following aspects:

(a) The Indian Railways had requested DoT for the allotment of an additional 5 MHz of spectrum in the 700 MHz band to them for the deployment of LTE-based network for safety and security applications, as a part of their indigenous radio-based Train Collision Avoidance System (TCAS) Kavach system.

(b) At present, the deployment of the Kavach system in the Indian Railways is a work-in-progress.[2] It is a capital-intensive project and is being implemented in a phased manner. In the past several union budgets, funds have allocated to Indian Railways for the phased implementation of the Kavach system.

[2] On 19.03.2025, the Ministry of Railways, Government of India issued a press release on 'Kavach: India's Cutting-Edge Automatic Train Protection System Reaches New Milestone with Version 4.0'. The relevant extracts of the said press release are given below:
"Kavach is an indigenously developed Automatic Train Protection (ATP) system. Kavach is a highly technology intensive system, which requires safety certification of highest order (SIL-4).
Kavach aids the Loco Pilot in running of train within specified speed limits by automatic application of brakes in case Loco Pilot fails to do so and also helps the trains to run safely during inclement weather.
…
Kavach was adopted as National ATP system in July 2020.
Implementation of Kavach System involves following Key Activities:
a. Installation of Station Kavach at each and every station, block section.
b. Installation of RFID Tags throughout the track length.
c. Installation of telecom Towers throughout the section.
d. Laying of Optical Fibre Cable along the track.
e. Provision of Loco Kavach on each and every Locomotive running on Indian Railways.
Based on deployment of Kavach version 3.2 on1465 RKm on south central Railway, lot of experience was gained. Using that further improvements were made. Finally, Kavach specification version 4.0 was approved by RDSO on 16.07.2024.
Kavach version 4.0 covers all the major features required for the diverse railway network. This is a significant milestone in safety for Indian Railways. Within a short period, IR has developed, tested and started deploying Automatic Train Protection System.
Major improvement in Version 4.0 includes increased Location Accuracy, Improved Information of Signal Aspects in bigger yard, Station to Station Kavach interface on OFC and Direct Interface to existing Electronic Interlocking System. With these improvements, Kavach Ver.4.0. is planned for large scale deployment over Indian Railways.
…
The cost for provision of Track Side including Station equipment of Kavach is approximately Rs. 50 Lakhs/ Km and cost for provision of Kavach equipment on locomotives is approximately Rs. 80 Lakh/ Loco.
The funds utilized on Kavach works so far is Rs. 1950 Crores. The allocation of funds during the year 2024-25 is Rs. 1112.57 Crores. Requisite funds are made available as per the progress of works."
Source: https://www.pib.gov.in/PressReleseDetailm.aspx?PRID=2112824

(c) Indian Railways has yet to deploy the proposed LTE-based network for their safety and security applications by using the frequency spectrum in the 700 MHz band. The proposed assignment of an additional 5 MHz of paired spectrum to the Indian Railways will provide the necessary certainty to the Indian Railways so that they can plan, design and implement an optimized communication network for meeting the bandwidth requirements of their safety and security applications.

(d) The DoT's view that the assignment of an additional spectrum will be considered only on the utilization of the already assigned 5 MHz (paired) frequency spectrum in the 700 MHz band would require the Indian Railways to plan, design and implement the LTE-based communication network over Indian Railways before they are even certain that the required quantum of the frequency spectrum in the 700 MHz band will be made available to them.

2.4.8 Considering the above aspects, the Authority is of the considered view that it is imperative that an additional 5 MHz of paired spectrum in the 700 MHz band is assigned to the Indian Railways forthwith so that they can plan, design and implement an optimized communication network for meeting the bandwidth requirements of their safety and security applications in a timely manner. Accordingly, **the Authority reiterates the Recommendation No. 3.1(a).**

2.5 **Recommendation No. 3.3:** *The Authority recommends that till the time, the field trial of RAN sharing through MOCN is conducted to ascertain feasibility of RAN sharing, in case Indian Railways intends to put to use the 5 MHz frequency spectrum in the 700 MHz band assigned to NCRTC and other RRTS/ Metro rail networks, in certain areas, it may be permitted to use this 5 MHz (paired) frequency spectrum on a payment basis provided that the same is not being used in such areas by NCRTC/ other RRTS/ Metro rail networks.*

2.6 **<u>DoT's Views on the Recommendation No. 3.3</u>:** *Since Indian Railways is yet to utilise the already assigned 5 MHz of paired spectrum in the 700 MHz, the Department is of the view that, this recommendation may not be considered.*

2.7 **<u>Response of TRAI w.r.t. DoT's Views on the Recommendation No. 3.3</u>**:

2.7.1 Before proceeding to examine the DoT's views on the Recommendation No. 3.3, it would be worthwhile to understand the context and rationale of the Recommendation No. 3.3. In this regard, the following points are noteworthy:

(a) In the para 2.22 of the Recommendations dated 20.12.2024, the Authority expressed its considered view that with the (proposed) assignment of an additional 5 MHz (paired) frequency spectrum in the 700 MHz band to the Indian Railways, they would have a total of 10 MHz (paired) frequency spectrum in the 700 MHz band, which might not be sufficient to fulfil the entire throughput requirement of the Indian Railways. [The Indian Railways had mentioned that out of the total uplink data requirement of about 45 Mbps only 3 Mbps would be served with the existing 5 MHz (paired) frequency spectrum, which would increase to 6.5 Mbps with 10 MHz (paired) frequency spectrum.]

(b) In the para 2.30 of the Recommendations dated 20.12.2024, the Authority noted that "*the 5 MHz (paired) spectrum assigned to NCRTC and also reserved for other RRTS/ Metro rail networks may not be utilized at all places. Keeping any chunk of frequency spectrum idle not only results in loss to the exchequer but is also a waste of precious scarce resource*."

(c) Considering the above, the Authority through the Recommendation No. 3.3 recommended that "*till the time, the field trial of RAN sharing through MOCN is conducted to ascertain feasibility of RAN sharing, in*

case Indian Railways intends to put to use the 5 MHz frequency spectrum in the 700 MHz band assigned to NCRTC and other RRTS/ Metro rail networks, in certain areas, it may be permitted to use this 5 MHz (paired) frequency spectrum on a payment basis provided that the same is not being used in such areas by NCRTC/ other RRTS/ Metro rail networks."

2.7.2 Based on the above description, it is clear that the underlying intent of the Recommendation No. 3.3 was to enable the Indian Railways to better meet their data throughput requirements in the areas where the 5 MHz (paired) spectrum in the 700 MHz band earmarked for NCRTC/ other RRTS/ Metro rail networks remains unutilized.

2.7.3 Having described the context and rationale of the Recommendation No. 3.3, the Authority proceeds to examine the DoT's views on the Recommendation No. 3.3.

2.7.4 With respect to Recommendation No. 3.3, DoT has stated that *"[s]ince Indian Railways is yet to utilise the already assigned 5 MHz of paired spectrum in the 700 MHz, the Department is of the view that, this recommendation may not be considered."*

2.7.5 Based on a careful examination of the DoT's views on the Recommendation No. 3.3, The Authority has made the following observations:

(a) DoT's view on the Recommendation No. 3.3 is solely based on its observation that "*Indian Railways is yet to utilize the already assigned 5 MHz of paired spectrum in the 700 MHz*". The Authority has already dealt with the aspect of utilization of the already assigned 5 MHz of paired spectrum in the 700 MHz band in detail in response to the DoT's views on the Recommendation No. 3.1(a) and has expressed its considered view that it is imperative that an additional 5 MHz of paired spectrum in the 700 MHz band is assigned to the Indian Railways <u>forthwith</u> so that they

can plan, design and implement an optimized communication network for meeting the bandwidth requirements of their safety and security applications in a timely manner.

(b) The (proposed) permission to the Indian Railways to use the 5 MHz (paired) frequency spectrum, which has been earmarked for NCRTC and other RRTS/ Metro rail networks in the 700 MHz band, on a payment basis in certain areas where the same is not being used by NCRTC/ other RRTS/ Metro rail networks will help the Indian Railways to better meet the data throughput requirements of their safety and security applications in such areas.

(c) In case the Government does not accept the Recommendation No. 3.3, the 5 MHz (paired) spectrum in the 700 MHz band earmarked for NCRTC/ other RRTS/ Metro rail networks will remain unutilized in a significant part of the country and would also not be available to the Indian Railways for better meeting the data throughput requirements of their safety and security applications in a large part of their rail network; in effect, this scarce spectrum which could be gainfully utilized by the Indian Railways would remain idle and get wasted.

(d) Conversely, the implementation of the Recommendation No. 3.3 would result in a better utilization of the frequency spectrum, which is a policy goal of the Government of India.

2.7.6 Considering the above aspects, the Authority is of the considered view that permitting the Indian Railways to use the 5 MHz (paired) frequency spectrum, which has been earmarked for NCRTC and other RRTS/ Metro rail networks in the 700 MHz band, on a payment basis in the areas where the same is not being used by NCRTC/ other RRTS/ Metro rail networks would serve the national interest. Accordingly, **the Authority reiterates the Recommendation No. 3.3**.

2.8 **Recommendation No. 3.6:** *The Authority recommends that spectrum charges for Indian Railways /NCRTC/ other RRTS/ Metro rail networks should be levied based on the formula for Royalty Charges and License Fees for captive use, as prescribed by DoT.*

2.9 **DoT's Views on the Recommendation No. 3.6:** *NCRTC was assigned 5 MHz of paired spectrum on administrative basis in the 700 MHZ band after the upfront payment of the Auction Determined Price (ADP). This was implemented based on the approval of the Union Cabinet.*

Accordingly, in order to harmonize all such administrative assignment of spectrum in the IMT bands, the Department is of the view that, it may be appropriate to adopt the spectrum charging methodology of upfront payment of the ADP mechanism for all administrative assignment of spectrum in the IMT bands, henceforth on prospective basis.

Such charging mechanism will enthuse efficiency in utilisation of spectrum by the user department, avoid hoarding/blocking of spectrum and avoid accounting problem due to assignment of spectrum in phased manner.

This upfront payment of ADP mechanism will also be applicable to the already assigned 5 MHZ of paired spectrum to the Indian Railways with prospective effect.

2.10 **Response of TRAI w.r.t. DoT's Views on the Recommendation No. 3.6:**

2.10.1 The Authority, vide its Recommendations on 'Allotment of spectrum to Indian Railways for Public Safety and Security services' dated 25th October 2019, recommended that spectrum charges for Indian Railways (IR) may be levied based on a formula as prescribed by DoT for Royalty Charges and License Fee for captive use.

2.10.2 Further, the Authority, in its Recommendation on 'Spectrum Requirements of National Capital Region Transport Corporation (NCRTC) for Train Control

System for RRTS Corridors' dated 28.12.2022, recommended a spectrum charging methodology based on Licensed Service Area (LSA)-wise Auction Determined Price (ADP) of the 700 MHz band for 10 years, adjusted on a pro-rata basis based on corridor area relative to the total geographical area of the LSA.

2.10.3 DoT through its reference dated 26.07.2023, inter alia requested TRAI to provide its recommendations on the following –

"(iii) Considering the different spectrum valuation methodology as recommended by TRAI for the 5 MHz of paired spectrum in the 700 MHz band, assigned to Indian Railways and for NCRTC, TRAI may examine and if found necessary recommend uniform spectrum valuation and charging methodology considering similar usage in the same spectrum band."

2.10.4 Subsequently, the Parliament enacted a new statute, namely, 'The Telecommunication Act, 2023' on 24.12.2023. The sub-section (4) of Section 4 of the Telecommunications Act, 2023 is reproduced below:

"The Central Government shall assign spectrum for telecommunication through auction except for entries listed in the First Schedule for which assignment shall be done by administrative process.

Explanation. - For the purposes of this sub-section, -

i. "administrative process" means assignment of spectrum without holding an auction;"

2.10.5 The First Schedule of the Telecommunications Act, 2023 lists 19 items for assignment of spectrum through the administrative process. The relevant items of the First Schedule are reproduced below:

"4. Disaster management, safeguarding life and property.

…….

6. Safety and operation of roads, railways, metro, regional rail, inland waterways, airports, ports, pipelines, shipping, and other transport systems.

……"

2.10.6 Presently, the spectrum charges for Indian railways are being levied on annual basis, as per DoT's order for payment of spectrum charges for assignment of frequencies to captive users (being provisionally charged on formula basis) for different types of Radiocommunications services and applications. The said order has been recently revised by DoT vide order no. P-11014/34/2009-PP dated 11.12.2023. (erstwhile DoT order no. P-11014/34/2009-PP dated 22.03.2012)

2.10.7 It is relevant to highlight that Indian Railways (IR) and Mass Rapid Transit Systems (MRTS), such as the National Capital Region Transport Corporation (NCRTC), play a pivotal role in delivering a wide range of financial, economic, and social benefits to the nation. Indian Railways and MRTS serve as indispensable components in public and national interests, reinforcing their strategic importance in the country's progress.

2.10.8 The indispensable role of railways is also highlighted by various prominent organizations:

- As per Asian Development Bank[3], Indian railways has been and continues to be the "lifeline for the socioeconomic growth of India," by connecting human settlements across the country and simultaneously transporting various resources to centers of production and markets.
- As per World Bank[4], Railways are a climate-smart and efficient way to move people and freight. Railways promote economic growth while cutting greenhouse gas emissions. They are a clean and compact way to move millions of passengers and millions of tons of goods across countries and continents.
- As per the policy document of Ministry of Housing and Urban Affairs (MOHUA)[5], Mass Rapid Transit Systems in urban areas enable swift and easy movement of people, contributing to economic growth and better

[3] https://www.adb.org/publications/speed-and-socioeconomic-development-influence-indian-railways)
[4] https://www.worldbank.org/en/topic/transport/brief/railways
[5] https://www.mohua.gov.in/upload/whatsnew/59a3f7f130eecMetro_Rail_Policy_2017.pdf

quality of life. These systems reduce external costs through decreased congestion, lower road and parking demand, and fewer per capita traffic accidents. They also reduce vehicle ownership and encourage compact, walkable urban development. Additionally, they lower travel costs and time, enhance city competitiveness, and significantly reduce pollution, thereby improving public health.

2.10.9 Based on the above, it is evident that the services being offered by both Indian Railways and Mass Rapid Transit Systems (MRTS) like NCRTC are of national importance and are integral to public interest. The strategic importance of these systems goes beyond transportation—they are indispensable pillars of national development and public welfare. Given these substantial contributions, the spectrum charging methodology for Indian Railways and NCRTC should acknowledge the nature of service and the broad benefits railway systems deliver. Such an approach should not only safeguard their sustainability but also amplify their role in advancing national priorities and public welfare. The spectrum charging should ensure that financial burdens, such as high spectrum charges, do not undermine this vital objective.

2.10.10 Further, for the purpose of calculating the spectrum charges for NCRTC, the Authority in 2022 recommended that the minimum protection width should be determined by DoT by undertaking a proof of concept (PoC) study. However, for the purpose of immediate spectrum allotment for setting up an LTE network by NCRTC, the Authority suggested that the minimum protection width along one side of the track center for calculating the corridor area be taken as 2.5 km. This minimum protection width was based on the information provided by NCRTC and was not substantiated by any technical studies/reports. However, Indian Railways has stated that for no interference, frequency reuse may be permitted beyond 26 km of the railway track based on the report on feasibility of co-existence of two separate LTE

networks done by Centre of Excellence in Wireless Technology, IIT Madras (CEWiT).

2.10.11 Accordingly, if the NCRTC formula is applied to Indian Railways (IR) for determining spectrum with minimum protection width as 26 km, the spectrum charges for Indian Railways will be significantly higher than that of NCRTC, even though both NCRTC and Indian Railways are utilizing the spectrum for similar purposes, i.e. for safety and security and not to offer any commercial services. In case the POC study conducted for NCRTC find that the requirement of a protection width for NCRTC is larger than 2.5 km or if the protection width as ascertained by Indian Railways is applied to NCRTC, the spectrum charges for NCRTC may also go up. This will in turn increase the operational cost of these entities.

2.10.12 Further, it is pertinent to mention that the auction-determined prices of spectrum used for access services are linked to a wide range of offerings, including internet, data, voice calls, SMS, and other related services. However, Indian Railways (IR) and NCRTC require spectrum in the 700 MHz band for enhancing safety and security. Since both entities require spectrum only for captive use and not for providing any commercial services, using the market-determined prices of access spectrum bands for determining spectrum charges for IR and NCRTC may not be appropriate.

2.10.13 Considering the critical role played by Indian Railways (IR) and NCRTC in serving public and national interests, it would not be appropriate to levy spectrum charges for these entities based on Auction Determined Prices (ADP) that reflects the value placed on the spectrum by entities intending to use it for commercial use. The economic value of spectrum for entities, such as Indian Railways and NCRTC, is fundamentally different from that of commercial service providers, as it does not include revenue-generating activities like commercial use of internet, voice, or data services. Thus, applying ADP, which reflects market-driven prices for commercial usage,

would not appropriately account for the public service nature and critical safety applications of IR and NCRTC.

2.10.14 In light of the above and considering DoT's reference dated 26.07.2023 requesting uniform spectrum charging methodology for IR and NCRTC, the Authority was of the view that Recommendations on 'Spectrum Requirements of National Capital Region Transport Corporation (NCRTC) for Train Control System for RRTS Corridors' dated 28.12.2022 required reconsideration.

2.10.15 It is pertinent to note that, the spectrum being demanded by Indian Railways as well as by NCRTC is for captive use for safety and security purposes. For assignment of spectrum for captive use, DoT has been following the policy of formula-based pricing which has been recently revised by DoT in December 2023. In addition, it is worth noting that, as per the First Schedule of the Telecommunication Act, 2023, spectrum required for the safety and operation of Railways shall be assigned through an administrative process.

2.10.16 Moreover, it is worth mentioning that spectrum charges for respective spectrum bands assigned administratively to various Ministries/Departments engaged in national safety and security, such as Defence and Space, are determined based on the formula prescribed by DoT. The spectrum charges for these Ministries/Departments are not determined based on auction determined prices (ADP). Further, since both NCRTC and Indian Railways require spectrum for the purpose of enhancing safety and security, there is no justification for levying spectrum charges based on ADP.

2.10.17 In line with the above, the Authority is of the considered view that spectrum charges for NCRTC and Indian Railways should be levied on an annual basis, in accordance with the DoT's order on the payment of spectrum charges for assignment of frequencies to captive users.

2.10.18 DoT, through its letter dated 16.06.2025 has stated that in order to harmonize all administrative assignment of spectrum in the IMT bands, it may be appropriate to adopt the spectrum charging methodology of upfront payment of the ADP mechanism for all administrative assignment of spectrum in the IMT bands, henceforth on prospective basis.

2.10.19 In this context, it is pertinent to mention that DoT through its reference dated 26.07.2023, inter alia requested TRAI to provide its recommendations on the following –

"(iii) Considering the different spectrum valuation methodology as recommended by TRAI for the 5 MHz of paired spectrum in the 700 MHz band, assigned to Indian Railways and for NCRTC, TRAI may examine and if found necessary recommend uniform spectrum valuation and charging methodology considering similar usage in the same spectrum band."

2.10.20 The Authority provided its recommendations on uniform spectrum charging methodology for Indian Railways and NCRTC. As detailed in the preceding paragraphs, while formulating its recommendation on the spectrum charging methodology for Indian Railways and NCRTC, the Authority considered several key factors, some of which are:

- Public Service and National Importance: Indian Railways and NCRTC play a vital role in serving public and national interests
- Captive Use for Safety and Security: The spectrum is being used solely for captive purposes related to safety and security, and not for offering commercial telecom services.
- Applicability of Telecommunication Act, 2023: As per the First Schedule of the Act, spectrum for safety and operation of railways is to be assigned through the administrative process.
- Use of Formula-Based Charging Mechanism by DoT: DoT has recently updated its formula of spectrum assigned to captive users in December 2023 and the same is being used for spectrum being assigned to other captive users.

- Auction-Determined Prices (ADP): ADP are linked to a wide range of commercial services. Indian Railways and NCRTC require spectrum in the 700 MHz band for enhancing safety and security. Since both entities require spectrum only for captive use and not for providing any commercial services, using the market-determined prices of access spectrum bands for determining spectrum charges for IR and NCRTC may not be appropriate.

2.10.21 Based on the above considerations, the Authority recommended that spectrum charges for Indian Railways and NCRTC should be levied on an annual basis, in accordance with the formula prescribed by DoT, and should not be linked to auction-determined prices.

2.10.22 With regard to DoT's view that ADP-based upfront charges should be adopted for all administrative spectrum assignments in IMT bands, it is pertinent to note that, spectrum charges for respective spectrum bands assigned administratively to various Ministries/Departments engaged in national safety and security, such as Defence and Space are not determined based on auction determined prices.

2.10.23 Furthermore, DoT vide its back reference dated 16.06.2025 has not provided any sound/detailed rationale for shifting from the formula-based approach to an ADP based upfront charging mechanism for all administrative assignments of spectrum in IMT bands. It may be noted that spectrum pricing for a particular service or entity is determined by the Authority only after detailed consideration of financial, technical, and sector-specific parameters, as well as prevailing market conditions and usage characteristics. These parameters differ significantly across services, and therefore, the Authority does not support DoT's blanket approach of applying ADP-based charges uniformly across all administrative assignments of spectrum in IMT bands without careful assessment of all relevant and contextual factors applicable in each case.

2.10.24 With regard to DoT's view that an ADP-based charging mechanism would encourage efficient utilisation of spectrum by user departments, avoid hoarding/blocking of spectrum and avoid accounting problems due to assignment of spectrum in phased manner. The Authority has already recommended that efficient and timely utilization of the frequency spectrum should be ensured through a process of periodic monitoring. Also, it has been recommended that upon implementation of LTE-based network for safety and security applications in the 700 MHz frequency band by the Indian Railways, DoT should take up the matter with Indian Railways for taking back the frequency spectrum assigned to Indian Railways in other frequency bands viz. 146-174 MHz, 400 MHz band, and 900 MHz band in a time-bound manner.

2.10.25 Furthermore, since both Indian Railways and NCRTC require spectrum for captive use related to safety and security, the issue of hoarding or blocking of spectrum does not hold relevance.

2.10.26 Additionally, the formula-based charging mechanism prescribed by DoT may offer a simpler and more uniform billing approach compared to ADP-based charges, which vary across Licensed Service Areas (LSAs). Therefore, in the present context, DoT's concerns regarding hoarding or blocking of spectrum and accounting-related challenges do not appear to be well-founded.

2.10.27 In view of the above, **the Authority reiterates its earlier recommendation**.

ANNEXURES

Annexure-I: DoT letter dated 26.07.2023 (with Annexure-II and III)

Government of India
Ministry of Communications
Department of Telecommunications
Wireless Planning & Coordination Wing

6th floor, Sanchar Bhawan,
20, Ashoka Road, New Delhi-110001.

No.: L-14001/13/2023-IMT Date: 26.07.2023

To,

The Secretary
Telecom Regulatory Authority of India
Mahanagar Doorsanchar Bhawan
Jawahar Lal Nehru Marg (Old Minto Road)
New Delhi - 110002.

Subject: Seeking recommendations of TRAI on allotment of additional spectrum to Indian Railways for its safety and security applications in the 700 MHz band - reg.

Sir,

This is to inform that Indian Railways has requested for additional 5 MHz of paired spectrum in the 700 MHz band to be allocated free of cost for enhancing its safety and security systems (Annexure – I).

2. Based on an earlier request from Indian Railways, the recommendations of TRAI were sought in the matter and TRAI provided its recommendations on this subject on 25-10-2019.

2.1. Later, based on the approval of Cabinet, Indian Railways was assigned 5 MHz of paired spectrum in the 700 MHz band on 22-10-2021 (Annexure – II). IR was also intimated about the withdrawal of its GSM-R spectrum holding in the 900 MHz band in 14 LSAs, upon migration to LTE based network. The Indian Railways is yet to confirm the migration to the LTE based network.

3. Meanwhile, the request of National Capital Region Transport Corporation (NCRTC) for 5 MHz of paired spectrum in the 700 MHz was also considered in the Department. Subsequently, the TRAI recommendations were sought and based on the recommendations dated 28-12-2022, DoT provisionally assigned 5 MHz of paired spectrum to NCRTC and the roll out of the LTE network is under process. The assignment of spectrum to NCRTC shall be regularized after the approval of the Union Cabinet.

4. Recently, based on the request from BSNL, the Cabinet has approved the reserving of 10 MHz of paired spectrum in the 700 MHz band in lieu of the 10 MHz of paired spectrum already reserved in the 600 MHz band. After considering this request of BSNL only 5 MHz of paired spectrum is presently available as vacant spectrum in the 700 MHz band. The present spectrum holding of the various TSPs/users in the 700 MHz band is placed at Annexure -III.

5. Recently, the Indian Railways has sought additional 5 MHz of paired spectrum, free of cost, in the 700 MHz band citing the following points –

(i) IR's indigenous development of Radio based Train Collision Avoidance System (TCAS) Kavach became successful. Radio based TCAS shall be the IR's ATP instead of ETCS level 2. Hence It is requested that Railways be allotted additional 5 MHz spectrum for design optimization of the network, when IR implements LTE network in 700 MHz band for safety & security applications.

(ii) The recent Balasore incident has shown that for the purpose of safety, it is important to capture large scale data & videos from moving trains on a real time basis. Dumping at a stopping station, which has high-capacity WiFi, shall not serve the objective. Further, during exigencies, the TSP's network gets choked thereby adversely affecting the relief and restoration operations.

(iii) When Railways implements its LTE network & Kavach over LTE, it shall surrender frequencies in the 146-174 MHz presently being used for driver-guard & driver/guard to station communication as well as in the 400 MHz band being used for Kavach and consolidate all its requirements in 700 MHz band provided adequate bandwidth is available.

(iv) Utilization of this spectrum by other users can be done provided the same does not cause any interference to the network of IR.

6. Further, as per the TRAI recommendations on assignment of spectrum to Indian Railways, 5 MHz of paired spectrum has been assigned to Indian Railways on administrative basis and spectrum charges are to be paid annually on the formula basis similar to other captive users. However, for NCRTC, TRAI has recommended to levy .5 times the Auction Determined Price based on the area of LSA and on pro rata basis for the assignment of spectrum for a period of 10 years. Thus, the per km spectrum charges for NCRTC shall vary from LSA to LSA based on the Auction Determined Price (ADP), whereas for IR charges are fixed irrespective of the LSA. An indicative calculation sheet highlighting the difference in spectrum charging across each LSA is attached herewith (Annexure -IV).

6.1 From the above it is evident that spectrum charges for NCRTC is many fold greater than that of IR in the LSAs having more ADP, whereas in some LSAs where ADP is less and LSA area is more, spectrum charges for IR is many fold greater than that of NCRTC. Hence TRAI may be requested to recommend a uniform spectrum valuation and charging methodology considering similar usages in the same spectrum band.

7. In view of the above, TRAI is requested to examine and provide its recommendations on -

(i) the assignment of 5 MHz of additional spectrum to Indian Railways in view of its earlier recommendations dated 25-10-2019 and also in the context of its earlier recommendations with respect to NCRTC dated 28-12-2022 and auction of spectrum dated 11-04-2022.

(ii) While providing the recommendations, TRAI may also consider the possibility of sharing of the spectrum between IR/NCRTC/RRTS/Metro and other similar networks to ensure the efficient utilization of spectrum.

(iii) Considering the different spectrum valuation methodology as recommended by TRAI for the 5 MHz of paired spectrum in the 700 MHz band, assigned to Indian Railways and for NCRTC, TRAI may examine and if found necessary recommend a uniform spectrum valuation and charging methodology considering similar usages in the same spectrum band.

(iv) Any other recommendations deemed fit for the purpose.

Encl: As above.

26.07.2023

(Gulab Chand)
Joint Wireless Adviser

Annexure - II

Government of India
Ministry of Communications
Department of Telecommunications
Wireless Planning and Coordination (WPC) Wing
6th floor, Sanchar Bhawan,
20, Ashoka Road, New Delhi – 110001.

No.: L-14001/01/2019-NTG (Pt.) Date: 22.10.2021

To,

Executive Director (Tele Div)
Railway Board
Ministry of Railways

Subject: Allotment of 5 MHz (paired) spectrum to Indian Railways in 700 MHz band for Public Safety and Security services at Stations and in the Trains for Captive use.

Reference: Ministry of Railways' O.M. No. 2017-Tele/14(1)/1 Pt. dated 23.06.2021.

Sir,

I am directed to refer to Ministry of Railways' Office Memorandum dated 23.06.2021 on the above subject and to inform that in accordance with the Cabinet decision taken in its meeting held on 09.06.2021, 5 MHz (paired) spectrum in the spectrum block 713-718/768-773 MHz is hereby assigned to Indian Railways for Public Safety and Security services for Captive use, with the following conditions:

(i) This spectrum assignment is being made for captive use along the Railway track only and not to offer any Commercial Services such as Internet/Wi-Fi onboard.

(ii) Annual spectrum charges for this assignment will be levied based on formula as prescribed by WPC Wing, DoT, from time to time for Royalty Charges and License Fee for Captive usages. Addition of new base stations and mobile terminals shall be intimated by Indian Railways without any delay.

(iii) Efficient and timely utilization of spectrum will be ensured by Railways through a process of periodical monitoring.

(iv) The 1.6 MHz (paired) spectrum already assigned to Indian Railways in 900 MHz band will be taken back from Indian Railways upon migration to LTE based network.

(v) As Indian Railways would be using the assigned spectrum along its railway track network and stations only, DoT may consider assigning the same spectrum in other areas for area-specific limited use to other entities for captive use. However, it will be ensured that there is no interference to the Railways' network from such use.

(vi) Applicable procedures for Letter of Intent (LoI), Decision Letter (DL), SACFA clearance and Wireless Operating License (WOL), as being followed for GSM-R network, shall be followed by Indian Railways for all the base/mobile stations.

(vii) Operations should not commence without obtaining Wireless Operating License (WOL) for the network as per applicable procedure.

(viii) Connection of this network to Public Switched Telecom Network (PSTN) shall not be allowed.

22.10.2021

(Neeraj Juyal)
Assistant Wireless Adviser
Phone: 2372 3595

Annexure-III

Spectrum utilisation in the 700 MHz IMT band

SL No	Uplink		Downlink		Quantum (MHz)	TSP/User
	Start (MHz)	Stop(MHz)	Start (MHz)	Stop(MHz)		
1.	703	713	758	768	10	Government User
2.	713	718	768	773	5	Indian Railways
3.	718	723	773	778	5	NCRTC/RRTS
4.	723	733	778	788	10	Reliance Jio
5.	733	738	788	793	5	Vacant
6.	738	748	793	803	10	Reserved for BSNL
7.	748	758			10	Guard band

Annexure-II: DoT's Back-reference dated 16.06.2025

Government of India
Ministry of Communications
Department of Telecommunications
Wireless Planning & Coordination Wing

6th floor, Sanchar Bhawan,
20, Ashoka Road, New Delhi-110001.

No.: L-14001/13/2023-IMT

Date: 16.06.2025

To,

The Secretary, TRAI
G/90, Nauroji Nagar Market,
Block G, Block F, Nauroji Nagar,
New Delhi, Delhi 110029

भारतीय दूरसंचार विनियामक प्राधिकरण
पंजीकरण सं. 1385
19 JUN 2025
ई आफिस सं.

Subject: Back reference on TRAI recommendations dated 20-12-2024 on "Assignment of Additional Spectrum to Indian Railways for its Safety and Security Applications" - reg.

Sir,

The undersigned is directed to refer TRAI Letter. No. R-13/(I)/2024-NSL-II dated 20-12-2024 vide which TRAI has provided their recommendations on "Assignment of Additional Spectrum to Indian Railways for its Safety and Security Applications". These recommendations have been considered by the Department and the following has been decided:

i. There is a need to seek reconsidered recommendations from TRAI in respect of some of the recommendations/sub-sections of recommendations. Such recommendations/ sub-sections of recommendations and the issues involved therein are enclosed as **Annexure-I**.

ii. Rest of the recommendations are accepted.

2. In view of the above, TRAI is requested to provide reconsidered recommendations, in accordance with the provisions of Section 11 of the TRAI Act 1997, as amended in 2000, on the recommendations listed in **Annexure-I**.

3. This issues with approval of competent authority.

Encl: As above.

(M Revathi)
Joint Wireless Adviser

Annexure-I

Issues for reconsideration of TRAI arising from its recommendations dated 20-12-2024 on "Assignment of Additional Spectrum to Indian Railways for its Safety and Security Applications"

1. Assignment of additional 5 MHz of paired spectrum to Indian Railways in the 700 MHz band (Para 3.1(a) of the TRAI Recommendations):

Indian Railways (IR) is yet to utilise the 5 MHz of paired spectrum already assigned to them in the 700 MHz. Since, IR has not yet deployed their network they have not shared the base station deployment details to arrive at the spectrum charges payable as per the formula-based charging. Hence, so far, they have not paid any spectrum charges for the already assigned 5 MHz spectrum in 700 MHz band.

In view of the above, the Department is of the view that the Assignment of additional spectrum will be considered only on utilisation of the already assigned 5 MHz (paired) frequency spectrum in the 700 MHz frequency band and the assignment will be based on Auction Determined Price (ADP) on upfront payment of spectrum charges.

2. Use of 5 MHz of paired spectrum assigned to NCRTC and other RRTS / Metro rail networks (Para 3.3 of the TRAI Recommendations):

Since Indian Railways is yet to utilise the already assigned 5 MHz of paired spectrum in the 700 MHz, the Department is of the view that, this recommendations may not be considered.

3. Spectrum charges for Indian Railways /NCRTC/ other RRTS/ Metro rail networks (Para 3.6 of the TRAI Recommendations) :

NCRTC was assigned 5 MHz of paired spectrum on administrative basis in the 700 MHz band after the upfront payment of the Auction Determined Price (ADP). This was implemented based on the approval of the Union Cabinet.

Accordingly, in order to harmonize all such administrative assignment of spectrum in the IMT bands, the Department is of the view that, it may be appropriate to adopt the spectrum charging methodology of upfront payment of the ADP mechanism for all administrative assignment of spectrum in the IMT bands, henceforth on prospective basis.

Such charging mechanism will enthuse efficiency in utilisation of spectrum by the user department, avoid hoarding/blocking of spectrum and avoid accounting problem due to assignment of spectrum in phased manner.

This upfront payment of ADP mechanism will also be applicable to the already assigned 5 MHz of paired spectrum to the Indian Railways with prospective effect.

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