**Telecom Regulatory Authority of India**

सत्यमेव जयते

# Recommendations

# On

# Reserve Price for Auction of Spectrum in the 800 MHz Band

(Response to reference received from Department of Telecommunications on Recommendations of 22nd February 2014)

**27th November 2014**

Mahanagar Doorsanchar Bhawan,

Jawahar Lal Nehru Marg, New Delhi-110002

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# CHAPTER-I: INTRODUCTION

1. The Department of Telecommunications (DoT), through its letter dated 12th December 2013 sought TRAI's recommendations on the reserve price for 800 MHz band in all the service areas in terms of clause 11(1)(a) of the TRAI Act. The Authority issued its recommendations on 'Reserve Price for Auction of Spectrum in the 800 MHz Band' on 22nd February 2014.

2. In its recommendations of February 2014, the Authority discussed the diminishing interest in the CDMA services mainly in terms of the steady decline in the CDMA subscriber base and lower Average Revenue per User (ARPU) as compared to GSM services. The Authority observed that Telecom Service Providers (TSPs) in a number of countries in the Americas, Australia and Asia had deployed HSPA technology[1] in this band. In the last few years, a few deployments of LTE[2] and even LTE-Advanced have come up in this band. There is an impressive existing device eco-system of HSPA technology; and a similar eco-system for LTE technology is fast evolving. Accordingly, the Authority emphasized that the use of 800 MHz band should not be limited to the deployment of CDMA technology; the 800 MHz band should be viewed and valued as a sub 1-GHz band with the potential to deliver data services using the latest technologies.

3. There is no denying the fact that the larger the contiguous block of spectrum, the better is the spectral efficiency and the higher the cell throughput. Smaller channel bandwidths (<5MHz) are less efficient due to factors such as higher proportional signalling overheads, less trunking efficiency etc. Fragmented and small chunks of spectrum not only lead to reduced efficiency in the use of spectrum but also

[1] High Speed Packet Access: It is an evolution of 3G technology.
[2] Long-Term Evolution: Technology for high speed mobile data; further evolution of mobile technology.

pose a hindrance to the adoption of latest technologies in line with international usage because 5 MHz is the minimum amount of contiguous spectrum required for the effective roll-out of most of the technologies. Therefore, the Authority recommended that large contiguous blocks (at least 5 MHz) and sufficient quantum of spectrum should be made available to operators to achieve better efficiencies and throughputs. Accordingly, it recommended that "*At least one chunk of contiguous 5 MHz spectrum (i.e. 4 carriers) should be carved out before the auction. The carrier reassignment, if required, may be carried out amongst the existing TSPs in the 800 MHz band to make at least 4 contiguous carriers available. Alternatively, the NIA for the auction may clearly stipulate that only contiguous blocks of 5 MHz will be sold. However, the reconfiguration of the frequencies should be worked out while auction is underway so that the reassignment is possible to be effected on completion of the auction.*"

4. The Authority observed that the CDMA subscriber base of the two PSUs - MTNL/BSNL - was continuously declining and they are catering to a meagre 2% of the total CDMA subscriber base. Their use of 800 MHz spectrum is grossly sub-optimal. Therefore, the Authority recommended that "*The DoT should take back from MTNL its entire spectrum holding in the 800 MHz band, BSNL should be allowed to retain only one CDMA carrier in all the LSAs except in Jammu and Kashmir, Assam and North-East LSAs, where it can retain both the carriers. The DoT should take back other carriers assigned to BSNL in the 800 MHz band.*"

5. The Authority also examined the feasibility of reconfiguring the allocated frequencies so as to make contiguous allocations. It found that reconfiguration of frequencies in the 800 MHz band (to make available contiguous spectrum) was both feasible, relatively inexpensive and could be done with minimum disruption (A specific illustration was provided in the recommendations). The efforts and the expenditure required in such an exercise are certainly not going

to be significant. In contrast, the advantages accruing from such realignment would be very significant. Making available contiguous blocks in 5 MHz would unlock much greater value.

6. The recommendations also discussed the various methodologies that had been used to arrive at the valuation of the spectrum in the 800 MHz band. The Authority recommended reserve prices of the spectrum in the 800 MHz band on the basis of the valuation of the spectrum.

7. Most of these recommendations have been referred back to the Authority by the DoT through its letter dated 14th November 2014 for reconsideration. The Authority's earlier recommendations, the views of the DoT thereon, and the response of the Authority are given in Chapter II.

# CHAPTER-II: PARAWISE RESPONSE

**1. Para 4.1**

*The Authority recommends that:*

a. *The DoT should take back from MTNL its entire spectrum holding in the 800 MHz band.*

b. *BSNL should be allowed to retain only one CDMA carrier in all the LSAs except in Jammu and Kashmir, Assam and North-East LSAs, where it can retain both the carriers. The DoT should take back other carriers assigned to BSNL in the 800 MHz band.*

(Para 2.40 of the recommendations)

**DoT View**

a. The DoT has considered the response of MTNL in this regard. Taking into account view – points of MTNL, the entire spectrum held by MTNL in Delhi and Mumbai is being planned to put in the forthcoming auction of 800 MHz band.

b. The DoT has considered the response of BSNL in this regard taking into the view-points of BSNL, 1 carrier surrendered by BSNL in 10 LSAs, namely, Andhra Pradesh, Bihar (incl. Jharkhand), Gujarat, Haryana, Himachal Pradesh, Punjab, Uttar Pradesh (East), Uttar Pradesh (West) incl. Uttaranchal, Orissa and Kolkata is being planned to put in the forthcoming auction of 800 MHz band.

**Response of TRAI**

**The DoT has stated that the entire spectrum held by MTNL in Delhi and Mumbai and one carrier of BSNL in 10 LSAs viz. AP, Bihar, Gujarat, Haryana, Himachal Pradesh, Punjab, UP (East), UP (West), Orissa and Kolkata will be put to auction. In the case of BSNL, the DoT has not explained why the Authority's recommendations were being accepted for only 10 LSAs. It is not**

**clear why the recommendations are not being accepted in the remaining 7 LSAs.**

**First and foremost, the Authority would like to point out that both PSUs were allocated the spectrum in the 800 MHz band administratively and free of charge. Both the PSUs are Government owned companies and the DoT, being the licensor, has every right to take the spectrum back from them if they are not using it optimally and efficiently.**

**As brought out in the Authority's recommendations of September 2013 and February 2014, spectrum in the 800 MHz band assigned to PSUs is grossly unutilised. There is a continuous decline in the number of subscribers being served by them and their current combined CDMA subscriber base is only 2% of the total CDMA subscribers, while they hold nearly 24% of the total spectrum assigned in the 800 MHz band. On average, they are serving around 13,500 subscribers per MHz, while private TSPs are serving around 2.24 lakh subscribers per MHz spectrum in this band i.e. private TSPs cater to almost 16 times more subscribers using the same amount of spectrum in the 800 MHz band.**

**The current position of the number of subscribers being served by MTNL in the two LSAs and BSNL in the 17 LSAs, where the Authority has recommended that spectrum carriers in excess of 1 should be taken back from BSNL, is given in the Tables below:**

**Table 1**
**MTNL's CDMA subscriber base (As of September 2014)**

| Sl. No. | LSA | MTNL Subscribers (Peak VLR) | Total subscribers in the LSA (Peak VLR) | MTNL subscriber base as a percentage of total CDMA subscriber base | MTNL's spectrum holding as a percentage of total CDMA spectrum assigned |
|---|---|---|---|---|---|
| 1 | Delhi | Services down since March 2014 | 5135137 | NIL[3] | 16.7% |
| 2 | Mumbai | 9654 | 3650508 | 0.3% | 22.2% |

[3] MTNL's CDMA network in Delhi is down since March 2014 as informed by MTNL.

**Table 2**

**BSNL's CDMA subscriber base in 17 LSAs where the Authority has recommended that spectrum carriers in excess of 1 should be taken back from BSNL[4]**

**(As on September 2014)**

| Sl. No. | LSA | BSNL Subscribers (Peak VLR) | Total subscribers in the LSA (Peak VLR) | BSNL subscriber base as a percentage of total CDMA subscriber base | BSNL's spectrum holding as a percentage of total CDMA spectrum assigned |
|---|---|---|---|---|---|
| 1 | Kolkata | 5018 | 1842020 | 0.3% | 18.2% |
| 2 | Maharashtra | 70016 | 3275311 | 2.1% | 25.0% |
| 3 | Gujarat | 51008 | 1721355 | 3.0% | 20.0% |
| 4 | Andhra Pradesh | 33722 | 2743345 | 1.2% | 25.0% |
| 5 | Karnataka | 54704 | 2686608 | 2.0% | 18.2% |
| 6 | Tamilnadu | 50481 | 2397531 | 2.1% | 18.2% |
| 7 | Kerala | 163178 | 1308682 | 12.5% | 25.0% |
| 8 | Punjab | 9717 | 543833 | 1.8% | 22.2% |
| 9 | Haryana | 8074 | 622465 | 1.3% | 28.6% |
| 10 | UP (West) | 21383 | 1750564 | 1.2% | 18.2% |
| 11 | UP (East) | 30708 | 2649408 | 1.2% | 25.0% |
| 12 | Rajasthan | 36323 | 2670351 | 1.4% | 18.2% |
| 13 | Madhya Pradesh | 44378 | 2335112 | 1.9% | 25.0% |
| 14 | West Bengal | 33606 | 2094230 | 1.6% | 20.0% |
| 15 | Himachal Pradesh | 20118 | 162638 | 12.4% | 33.3% |
| 16 | Bihar | 8132 | 2934156 | 0.3% | 25.0% |
| 17 | Orissa | 30502 | 468106 | 6.5% | 28.6% |
| | Total | 671068 | 32205715 | 2.1% | 22.4% |

**MTNL is serving less than 10,000 subscribers (0.3% of total CDMA subscriber base) in Mumbai. The task of taking back spectrum from MTNL in Delhi is a *fait accompli* as its CDMA services in Delhi are down since March 2014.**

**BSNL's position is no better. It is serving 2.1% subscribers in the LSAs where the Authority has recommended that spectrum carriers in excess of 1 should be taken back from it.**

**The sub-optimal utilisation of spectrum not only amounts to denial of the opportunity for its better use by others but also a revenue loss to the Government in terms of upfront payment, annual licence fees (LF) and spectrum usage charges (SUC). In**

[4] The LSAs, where DoT has agreed to take back spectrum in excess of 1 carrier in 800 MHz band from BSNL, have been shown shaded.

**addition, there is an opportunity cost to keeping the spectrum idle in terms of other taxes and levies such as service tax, corporate tax etc.**

**In view of the above, the Authority reiterates its earlier recommendation that *"The DoT should take back from MTNL its entire spectrum holding in the 800 MHz band. BSNL should be allowed to retain only one CDMA carrier in all the LSAs except in Jammu and Kashmir, Assam and North-East LSAs, where it can retain both the carriers. The DoT should take back other carriers assigned to BSNL in the 800 MHz band."***

**2. Para 4.1**

*The Authority recommends that:*

c. *The entire available spectrum with the DoT in the 800 MHz band should be put to auction.* (Para 2.40)

**DoT View**

DoT may take a view after receipt of reconsidered recommendation of TRAI

**Response of TRAI**

**Keeping spectrum idle amounts to a wastage of natural scarce resources and also results in a recurring loss of revenue to the Government (Please see response in preceding paragraph). The Authority cannot fathom any plausible reason why the entire spectrum should not be put to auction. Therefore, the Authority reiterates its recommendation that the <u>entire</u> available spectrum with the DoT in the 800 MHz band should be put to auction.**

**3. Para 4.1**

*The Authority recommends that:*

c. *At least one chunk of contiguous 5 MHz spectrum (i.e. 4 carriers) should be carved out before the auction. The carrier reassignment, if required, may be carried out amongst the existing TSPs in the 800 MHz band to make at least 4 contiguous carriers available. Alternatively, the NIA for the auction may clearly stipulate that only contiguous blocks of 5 MHz will be sold. However, the reconfiguration of the frequencies should be worked out while auction is underway so that the reassignment is possible to be effected on completion of the auction.* (Para 2.40)

**DoT View**

It is noted that the following with regard to making available at least one chunk of contiguous 5 MHz spectrum in all the service areas.

(i) In the 4 LSAs, namely, Mumbai, Madhya Pradesh, Assam and North East, at least one chunk of contiguous 5 MHz with necessary guard band is available. However, in Assam and North East, there are two contiguous chunks of 5 MHz each are available.

(ii) Recommendation of TRAI for auction of 800 MHz spectrum in chunks of 5 MHz is based on the assumption that two carriers of MTNL, one carrier of BSNL and one carrier of TTSL/TTML will be available for auction.

(iii) Further, M/s TTSL/TTML, vide their letter dated 9th April 2013 has stated, inter-alia, that without prejudice they, as a measure of abundant caution, despite serious adverse impact on its business and customers, have decided, and thus thereby, surrender under protest the CDMA spectrum held by them beyond 2.5 + 2.5 MHz in all circles except Delhi and Mumbai where they propose to retain spectrum upto 3.75 + 3.75 MHz.

TTSL/TTML has filed a Writ Petition No.10617 (W) of 2013 with CAN 7936 of 2013 in the Hon'ble High Court of Kolkata. The matter was heard on 19th April 2013, the extracts of the Order are as follows:

> "*The petitioners claim that the petitioners' offer to surrender a part of the spectrum was specified to be subject to the outcome of the petition. In reply to the petitioners' letter of April 9, 2013, the Department demanded the request for surrender of the spectrum to be "without any contention".*
>
> *Since it appears from the order dated April 19, 2013, that the petitioners were permitted to surrender a part of the CDMA spectrum without prejudice to their rights and contentions in the petition, the partial surrender of the spectrum will be accepted by the Department and the same will not prejudice the petitioners at the final hearing of the petition.*"

The Legal Opinion received by DoT indicates that the auction of spectrum proposed to be surrendered by M/s Tata Tele Services (TTL) and Tata Tele Services (Maharashtra) Ltd. (TTML) during the pendency of Writ Petitions before the Hon'ble High Courts of Bombay and Kolkata may likely to create third party interest, leading to legal complications.

The DoT is of the view that since the matter related to surrender of spectrum by TTSL/TTML is subjudice, the carriers proposed for surrender by TTSL/TTML cannot be considered for making a chunk of contiguous of 5 MHz.

Even after considering the surrender of two carriers by MTNL and surrender of one carrier in 10 LSAs by BSNL, it is not possible to carve out chunks of additional contiguous 5 MHz spectrum.

In view of the above, TRAI is requested to reconsider its recommendations.

**Response of TRAI**

**The purpose of recommending that at least one chunk of contiguous 5 MHz spectrum (i.e. 4 carriers) be carved out before the auction was twofold. First, it would facilitate adoption of other technologies (WCDMA/HSPA/LTE etc) if the TSP decides to do so. Secondly, contiguous spectrum reduces the requirement of inter-operator guard-band and results in better spectrum efficiency.**

**If the spectrum surrendered by TTSL/TTML and the spectrum to be taken back from the PSUs, as recommended by the Authority, are taken into account, 4 or more carriers will be available in all the LSAs except Rajasthan where only 2 carriers will be available.**

**As can be seen from Authority's response to the issue at Sl. No.1 above, it is of the firm view that spectrum in the 800 MHz be taken back from the PSUs as recommended.**

**TTSL surrendered the spectrum in April 2013 to absolve it from any liability arising out of the one-time spectrum charges (OTC) on spectrum holding beyond 2.5 MHz in the 800 MHz band. This spectrum has already been lying idle for the past 18 months. Since conclusion of the entire judicial process may take considerable time, keeping the spectrum idle till such time is certainly neither desirable nor does it make economic sense[5]. The Authority is also not aware about the legal action taken by the DoT to ensure that the spectrum is not kept idle but is gainfully employed.**

[5] The OTC issue dates to 2010. It applied to all allocated spectrum across all bands. Hence, even if the High Court takes a view in favour of the plaintiff (TSPs), the Government is not likely to accept such verdict. It will contest it in the Supreme Court. Thus, the entire process will take a lot of time.

**Moreover, as per the subscriber-linked criteria of DoT, which was last amended in January 2008, no additional spectrum beyond what is available with it after surrender is justified to TTSL except in Maharashtra. (See Table No. 3)**

**Table 3**

**Spectrum holding of TTSL after surrender vis-a-vis what is justified as per DoT's SLC of 2008 (As of September 2014)**

| Sl. No. | LSA | No. of Subscribers Peak VLR | Spectrum Assigned after surrender (MHz) | Justified spectrum as per SLC of DoT of Jan 2008 (MHz) |
|---|---|---|---|---|
| 1 | Delhi | 1,701,901 | 3.75 | 3.75 |
| 2 | Mumbai | 706,455 | 3.75 | 3.75 |
| 3 | Kolkata | 154,661 | 2.5 | 2.5 |
| 4 | Maharashtra | 1,412,603 | 2.5 | 3.75 |
| 5 | Gujarat | 279,524 | 2.5 | 2.5 |
| 6 | Andhra Pradesh | 784,986 | 2.5 | 2.5 |
| 7 | Karnataka | 227,247 | 2.5 | 2.5 |
| 8 | Tamilnadu | 165,762 | 2.5 | 2.5 |
| 9 | Kerala | 98,917 | 2.5 | 2.5 |
| 10 | Punjab | 216,903 | 2.5 | 2.5 |
| 11 | Haryana | 210,800 | 2.5 | 2.5 |
| 12 | UP (West) | 367,618 | 2.5 | 2.5 |
| 13 | UP (East) | 137,488 | 2.5 | 2.5 |
| 14 | Rajasthan | 381,564 | 2.5 | 2.5 |
| 15 | Madhya Pradesh | 223,390 | 2.5 | 2.5 |
| 16 | West Bengal | 8,737 | 2.5 | 2.5 |
| 17 | Himachal Pradesh | 37,399 | 2.5 | 2.5 |
| 18 | Bihar | 366,634 | 2.5 | 2.5 |
| 19 | Orissa | 143,300 | 2.5 | 2.5 |

**Even if it were to be assumed that TTSL's carriers are <u>not</u> available for the upcoming auction, 4 or more carriers will be available in as many as 15 LSAs and 2-3 carriers are available in the remaining LSAs, except in Rajasthan, where only one carrier will be available for the auction. (See Table 4 below)**

**Table 4**

**LSA-wise carrier availability in the 800 MHz band without considering TTSL's surrender of spectrum**

| Sl. No. | LSA | Total No. of carriers | Total No. of carriers assigned till date | No. of carriers available currently | Proposed surrender of carriers by MTNL /BSNL | Total |
|---|---|---|---|---|---|---|
| | A | B | C | D | E | F=D+E |
| 1 | Delhi | 14 | 13 | 1 | 2 | 3 |
| 2 | Mumbai | 14 | 10 | 4 | 2 | 6 |
| 3 | Kolkata | 13 | 12 | 1 | 1 | 2 |
| 4 | Maharashtra | 14 | 10 | 4 | 1 | 5 |
| 5 | Gujarat | 14 | 11 | 3 | 1 | 4 |
| 6 | Andhra Pradesh | 13 | 9 | 4 | 1 | 5 |
| 7 | Karnataka | 14 | 12 | 2 | 1 | 3 |
| 8 | Tamilnadu | 14 | 12 | 2 | 1 | 3 |
| 9 | Kerala | 14 | 13 | 1 | 2 | 3 |
| 10 | Punjab | 13 | 10 | 3 | 1 | 4 |
| 11 | Haryana | 14 | 8 | 6 | 1 | 7 |
| 12 | UP (West) | 14 | 12 | 2 | 1 | 3 |
| 13 | UP (East) | 14 | 9 | 5 | 1 | 6 |
| 14 | Rajasthan | 12 | 12 | 0 | 1 | 1 |
| 15 | Madhya Pradesh | 13 | 8 | 5 | 1 | 6 |
| 16 | West Bengal | 14 | 10 | 4 | 1 | 5 |
| 17 | Himachal Pradesh | 14 | 6 | 8 | 1 | 9 |
| 18 | Bihar | 14 | 9 | 5 | 1 | 6 |
| 19 | Orissa | 14 | 7 | 7 | 1 | 8 |
| 20 | Assam | 14 | 4 | 10 | 0 | 10 |
| 21 | North East | 14 | 4 | 10 | 0 | 10 |
| 22 | Jammu & Kashmir | 14 | 4 | 10 | 0 | 10 |
| | **Grand Total** | **302** | **205** | **97** | **22** | **119** |

**The chances of participation by a prospective new bidder will be more if it is offered contiguous 5 MHz of spectrum. It would make it feasible to deploy any technology. As stated in Para 2.38 of the recommendations, the Authority has examined the feasibility of reconfiguring the assigned carriers and has concluded that it is possible to make spectrum contiguous without much disruption. The efforts and expenditure required**

**are not significant. In contrast, the advantages accruing from such realignment will be very significant. It may also be pointed out that the Authority had never recommended that if less than 4 carriers were available in any LSA (e.g. Rajasthan), then they should not be auctioned. On the contrary, the Authority has recommended (see Para 2.40) that the <u>entire</u> available spectrum with the DoT in the 800 MHz band should be put to auction.**

**4. Para 4.1**

*The Authority recommends that:*

d. *A new entrant i.e. a TSP which does not have any spectrum holding in the 800 MHz band must bid for a minimum of 4 carriers. However, an existing TSP i.e. a TSP having some spectrum holding in the 800 MHz band should be permitted to bid for a minimum 1 block of spectrum. New entrants must be assigned the earmarked contiguous carriers only.* (Para 2.40)

**DoT View**

(i) The TRAI has recommended that:

a. "……New entrants must be assigned the earmarked contiguous carriers only."

b. It is presumed that this applies to any bidder including existing operators who becomes successful in getting 4 blocks in LSAs where contiguous carriers are offered in auction.

(ii) However, since a chunk of 5 MHz of contiguous spectrum is available only in 4 LSAs, this recommendation will restrict the new entrants for bidding spectrum only in these 4 LSAs.

(iii) Further, the issues brought out in para 4.3 may also be referred.

TRAI is requested to reconsider its recommendation.

**Response of TRAI**

**A contiguous block of 5 MHz is the minimum required quantum for the efficient deployment of new technologies. The Authority wants to facilitate the proliferation of new technologies which have higher spectral efficiency. Therefore, the Authority is of the view that a new entrant - a TSP which does not have any spectrum holding in the 800 MHz band - must bid for a minimum of 4 carriers. Since existing TSPs may require additional spectrum for capacity addition purposes, they may be permitted to bid for even 2x1.25 MHz (i.e. one block) of spectrum.**

**As mentioned earlier also, the chances of participation by a prospective new bidder will be greater if it is offered contiguous 5 MHz of spectrum. It would make it feasible to deploy any technology. Therefore, the Authority has recommended that new entrants must be assigned the earmarked contiguous carriers only.**

**As pointed out earlier, if the spectrum surrendered by TTSL and the spectrum to be taken back from PSUs as recommended by the Authority are taken into account, 4 or more carriers will be available in all the LSAs except Rajasthan where only 2 carriers will be available. Even if it is assumed that TTSL's carriers are not available for the upcoming auction, 4 or more carriers will be available in as many as 15 LSAs. In such a scenario, a condition can be imposed that a new entrant would be required to bid for a minimum of 2x5 MHz of spectrum in these 15 LSAs. In the LSAs, where spectrum put to auction is less than 4 carriers, the minimum spectrum required to be bid for should be kept at 2x3.75 MHz. This provision would make the entry of a new entrant feasible in all the remaining LSAs except Kolkata and Rajasthan.**

**5. Para 4.2**

*The Authority recommends that the reserve price for the forthcoming auction of 800 MHz spectrum should be fixed at 80% of the average valuation (Para 3.79).*

**DoT View**

DoT may take a view after receipt of reconsidered recommendation of TRAI.

**Response of TRAI**

**No comments. The Authority has been consistent in its approach in arriving at a reserve price after conducting valuation exercises. As a general principle, the reserve price had previously been fixed at 80% of the valuation of spectrum. This was based on considerations pertaining to auction efficiency, revenue maximisation and international practices. The Authority has adopted the same for the reserve price of 900 and 1800 MHz spectrum (see Recommendations of 9th September 2013) and in the case of the February 2014 Recommendations on 800 MHz spectrum.**

**6. Para 4.3**

*The recommended reserve prices for the forthcoming auction are tabulated below: (Para 3.80)*

*TABLE*
*RESERVE PRICE PER MHz IN 800 MHz BAND*

*(Rs.in crore)*

| *LSA* | *Category* | *Reserve Price per MHz (as calculated)* | *Recommended Reserve Price per MHz (rounded off)* |
|---|---|---|---|
| *Delhi* | *Metro* | *450.22* | *450* |
| *Mumbai* | *Metro* | *352.13* | *352* |
| *Kolkata* | *Metro* | *101.49* | *101* |
| *Andhra Pradesh* | *A* | *192.28* | *192* |
| *Gujarat* | *A* | *211.65* | *212* |
| *Karnataka* | *A* | *198.68* | *199* |

| | | | |
|---|---|---|---|
| *Maharashtra* | *A* | *282.05* | *282* |
| *Tamilnadu* | *A* | *246.85* | *247* |
| *Haryana* | *B* | *30.37* | *30* |
| *Kerala* | *B* | *69.41* | *69* |
| *Madhya Pradesh* | *B* | *64.37* | *64* |
| *Punjab* | *B* | *62.86* | *63* |
| *Rajasthan* | *B* | *58.85* | *59* |
| *U. P. (East)* | *B* | *83.92* | *84* |
| *U.P. (West)* | *B* | *93.17* | *93* |
| *West Bengal* | *B* | *46.45* | *46* |
| *Assam* | *C* | *26.79* | *27* |
| *Bihar* | *C* | *61.12* | *61* |
| *Himachal Pradesh* | *C* | *13.20* | *13* |
| *Jammu & Kashmir* | *C* | *8.46* | *8* |
| *North East* | *C* | *7.55* | *8* |
| *Orissa* | *C* | *24.94* | *25* |
| ***Pan India*** | | ***2686.79*** | ***2685*** |

**DoT View**

(i) TRAI has recommended the reserve price for right to use spectrum in 800 MHz band basically on the presumption that contiguous 5 MHz chunk of spectrum in 800 MHz band will be made available in all the LSAs at the time of auction by way of taking back the spectrum from MTNL, BSNL and re-assignment of carriers of some of the service areas. Further, it has been presumed that M/s TTSL/TTML has surrendered the spectrum in some of the service areas and the same is also available for auction whereas this is not a factual position as brought out above.

(ii) At present, contiguous spectrum of 5 MHz in 800 MHz band is possible only in four LSAs namely, Mumbai, Madhya Pradesh, North-East and Assam. The spectrum in rest of the service areas is available on non-contiguous basis.

(iii) In respect of auction of right to use spectrum in 1800 and 900 MHz band, the reserve price for contiguous and non-contiguous was same.

(iv) TRAI in its recommendation for reserve price for 800 MHz band has stated in para 3.15 that "…The number of data points is, therefore, inadequate to do any kind of meaningful market data analysis either by using single variable correlation or by establishing any relationship based on regression analysis as was done during the last exercise for 1800 MHz spectrum…".

(v) Further, the production function has also not been used in estimating the reserve price.

(vi) Auction determined price in 900 MHz band has been factored into while arriving at the recommended reserve price for 800 MHz in three service areas. It is felt that the inclusion of 900 MHz band market determined price deviates from existing approach.

As brought out above, there are only 4 LSAs where contiguous 5 MHz spectrum is available. Out of these 4 LSAs, in 3 LSAs 1 to 2 carriers each of 1.25 MHz are available in addition to 5 MHz contiguous spectrum. In the remaining 18 LSAs there is no 5 MHz contiguous spectrum. Following two options emerge:

a) Contiguous 5 MHz spectrum in 4 LSAs and non-contiguous blocks of 1.25 MHz spectrum in 18 LSAs are put to auction;

b) Spectrum in all LSAs is put to auction in non-contiguous blocks of 1.25 MHz after taking care of spectrum required for guard band.

Before exercising any of the above options, it is important to decide whether the price for contiguous and non-contiguous spectrum remains the same. If the price remains the same, option (a) can be modified and in the 4 LSAs non-contiguous spectrum can also be sold along with spectrum in the 4 LSAs cannot be put to auction, as in the same LLSAs it does not appear feasible to sell spectrum at two different rates in the same auction process. In this situation, even the contiguous spectrum may need to be auctioned in blocks of non-contiguous spectrum in blocks of 1.25 MHz. In this situation only option 'b' can only be selected.

TRAI is requested to review the recommendation on the price of spectrum in the light of issues brought out in above along with any changes required in eligibility criteria for bidding with respect to number of blocks and quantum of spectrum to be put to auction.

**Response of TRAI**

**(i) The Authority did not proceed on the basis of any presumption while recommending the reserve price for the spectrum in the 800 MHz spectrum. The Authority, in making its Recommendations on contiguity, was pointing to the need for contiguity to unlock the value of spectrum by increasing spectral efficiency and reducing associated transaction costs. The valuation and reserve prices set were <u>not</u> contingent on the contiguity of spectrum. Nowhere had the Authority presumed that contiguous blocks of spectrum would be available while making its Recommendations <u>on valuation and reserve price</u>. The burden of any presumption to the contrary will lie with DoT, and <u>not</u> with the Authority.**

**(ii) As already pointed out in the response to paragraph 4.1 above, 4 or more carriers will be available in all the LSAs except Rajasthan (where 2 carriers will be available).**

**(iv) No comments. Paragraph 3.15 of the February 2014 Recommendations of the Authority succinctly brings out the reasons why meaningful market data analysis using multiple regression cannot have been done (as was done in the Recommendations of 9th September 2013) in the absence of adequate empirical data.**

**(v) The production function approach was adopted as one methodology in the valuation of 1800 MHz spectrum in the Authority's September 2013 Recommendations. The base data required to develop this model was available with TRAI. A panel data set for minutes of usage, BTS and amount of spectrum**

**held by established private TSPs in the GSM segment (having pan-India presence) across the different categories of LSAs over the period 2007-2012 (yearly data) was utilized to get the required estimated coefficients based on regression (panel-level). These coefficients were eventually used to derive the value of the spectrum in the 1800 MHz band relying on the substitutability between BTS and spectrum.**

**As regards the adoption of the production function approach in the valuation exercise of 800 MHz spectrum (February 2014 Recommendations), it may be noted that the required sample panel data set available is not exhaustive enough to carry out a similar exercise as was done in the case of 1800 MHz spectrum. Only two major established private TSPs in the CDMA segment are in operation for more than 5 years with a pan-India presence providing services using 800 MHz spectrum. The necessary data on variables: minutes of usage, BTS and amount of spectrum held for estimating the value of spectrum using production function methodology is available only for these 2 TSPs as against 6 TSPs in case of 1800 MHz spectrum valuation. The availability of sample data points is of enormous significance to carry out any meaningful panel data regression under the production function approach to get statistically reliable and meaningful estimated coefficients. The limited number of data points would not render any useful analysis and would invariably end up giving unstable results. Therefore, the production function approach was not used as a method in the valuation exercise of 800 MHz spectrum. Moreover, even during the consultation process, none of the stakeholders suggested this model as an alternative approach.**

**(iii) and (vi)**

**In Para 3.68 of the Recommendations of February 2014, the Authority has explained the background and the rationale for**

**inclusion of February 2014 auction revealed market prices of 900 MHz in Delhi, Mumbai and Kolkata LSAs as one probable valuation in arriving at the average expected valuation of 800 MHz spectrum. The Authority has consistently supported the view that market-based valuation of spectrum through auction is the best possible indicator of spectrum value.**

**As pointed out by DoT itself [paragraph (iii) of the DoT's reference], the reserve price was the same for contiguous and non-contiguous spectrum in the Authority's Recommendations on 900 and 1800 spectrum. The Authority's approach is consistent in the case of the 800 MHz spectrum as well. DoT's query on whether the price recommended by the Authority for 800 MHz spectrum is for contiguous spectrum or non-contiguous spectrum of 800 MHZ is <u>not</u> pertinent as far as valuation of 800 MHz spectrum recommended by the Authority is concerned. It may be noted here that availability of spectrum in contiguous form improves the spectral efficiency of the band (see response above to paragraph 4.1 of DoT's reference). That contiguous spectrum enables delivery of services in a more efficient and effective manner is not denied. However, the valuation exercise for 800 MHz spectrum done by the Authority was based on the relative technical efficiency compared to the 1800 MHz band/900MHz band as well as on approaches based on economic/commercial factors without having any bearing of availability of spectrum in contiguous or non contiguous form. The valuation recommended by the Authority is for 800 MHz spectrum and forms the basis for arriving at the reserve price. The existence of contiguity (or non-contiguity) has no bearing on this; i.e., the allotment of frequency by the DoT or actual utilisation by the prospective bidder has no relevance for the valuation exercise and, consequently, for the setting of reserve price. It may also be noted here that in the September 2013 Recommendations, the Authority had recommended average**

**valuation and reserve price for 1800 MHz spectrum and 900 MHz spectrum. Based on these recommendations, DoT held the auction of 1800 MHz spectrum and 900 MHz spectrum in February 2014 without going into the issue of separate reserve price for contiguous or non-contiguous spectrum though the entire spectrum offered on auction was not contiguous.**

**UPDATED VALUATION OF 800 MHz SPECTRUM**

**With respect to the DoT's request to review the recommendation on the price of spectrum, the Authority is of the view that since the reserve prices have been referred for reconsideration, it is obliged to take into account developments subsequent to its earlier Recommendations of February 2014 for the 800 MHz band. The Authority has made Recommendations on the 'Valuation and Reserve Price of Spectrum: Licences Expiring in 2015-16' on 15th October 2014 in which it conducted a fresh valuation exercise for the 1800 MHz band. The Authority cannot be oblivious to the change in circumstances (see paragraphs 3.4 to 3.7 of the October 2014 Recommendations) that led to the fresh valuations for the 1800 MHz band. These updated valuations would need to be incorporated into the valuation of the 800 MHz band in view of the DoT's present reference.**

**The recommendations on valuation and reserve price of 800 MHz spectrum were sent to DoT on 22nd February 2014. The average valuation of 800 MHz spectrum was the simple mean of the values estimated by the following five different valuation approaches:**

**(a) 1.5 times of value of 1800 MHz band**

**(b) 2 times of value of 1800 MHz band**

**(c) Producer Surplus Model**

**(d) Model based on projected revenue from data services**

**(e) February 2014 auction determined price of 900 MHz spectrum (for 3 metro LSAs)**

**The aforementioned approaches were adopted using data/information available at that time. In the approaches at (a) and (b), the February 2014 auction determined price of 1800 MHz spectrum was taken as the value of 1800 MHz spectrum. The Authority in its Recommendations on 'Valuation and Reserve Price of Spectrum: Licenses Expiring in 2015-16' dated 15th October 2014 calculated the value of 1800 MHz spectrum afresh after taking into consideration changes in the telecom service sector since the last valuation exercise of 1800 MHz spectrum. Similarly, the approaches at (c) and (d) used the input data/information primarily of the year 2012-13. Now, some data/information for the year 2013-14 is also available with the Authority. There has been a change in the revenue mix of both the GSM and CDMA segments as well as cost composition under different heads. Projected subscribers' growth also needed revision in the light of current data/trends. There has been an important change in the development of the telecom sector. The significant increase in the growth of data usage cannot be ignored.**

**All the facts brought out above and taken together support the need for updating various assumptions/input data and updating the valuation of 800 MHz spectrum. The modified assumptions are given at Annexure-A. Taking these together and in line with the viewpoint taken in October 2014 Recommendations on valuation and reserve price of 1800 MHz spectrum, the valuation of 800 MHz spectrum has been recalculated. The re-calculated valuation of 800 MHz spectrum under each valuation approach based on the modified assumptions and updated data/information is given in Annexure-B.**

**The Authority is also conscious of the need to give a fillip to penetration of telecom services in the North East for improving the economic well-being of the region, given its peculiar geography, needs and particular circumstances. To accelerate the pace of investment in telecom infrastructure in the North East LSA, the Authority recommended (in its October 2014 Recommendations) that the reserve price for 1800 MHz spectrum should be kept at 50% of the calculated reserve price. Consistent with this approach, the Authority is of the view that the reserve price for 800 MHz spectrum in the North East LSA should also be kept at 50% of the reserve price indicated in Annexure B. The Authority accordingly recommends that the reserve price for North East LSA may be fixed at a discount of 50% on the reserve price.**

**Accordingly the Authority recommends that the reserve price for 800 MHz spectrum for each LSA should be as indicated in the following table:**

**Table 5**

**VALUATION AND RESERVE PRICE PER MHz IN 800 MHz BAND**

**(Rs. in crore)**

| LSA | Category | Recommended Reserve Price per MHz (rounded off) |
|---|---|---|
| Delhi | Metro | 494 |
| Mumbai | Metro | 352 |
| Kolkata | Metro | 117 |
| Andhra Pradesh | A | 187 |
| Gujarat | A | 220 |
| Karnataka | A | 242 |
| Maharashtra | A | 272 |
| Tamilnadu | A | 288 |
| Haryana | B | 38 |
| Kerala | B | 99 |
| Madhya Pradesh | B | 91 |
| Punjab | B | 85 |
| Rajasthan | B | 124 |
| U. P. (East) | B | 134 |
| U.P. (West) | B | 95 |
| West Bengal | B | 57 |
| Assam | C | 28 |
| Bihar | C | 85 |
| Himachal Pradesh | C | 19 |

| | | |
|---|---|---|
| **Jammu & Kashmir** | **C** | **28** |
| **North East** | **C** | **11** |
| **Orissa** | **C** | **38** |
| **Pan India** | | **3104** |

**OTHER ISSUES RAISED BY THE DOT**

**(i) No recommendation for Spectrum Usage Charges (SUC)**

**DoT's view**

It is noted that no recommendation has been made with respect to Spectrum Usage Charges (SUC) by the TRAI. Hence DoT is of the view that TRAI may like to consider making recommendations on rates of SUC for 800 MHz band.

**Response of TRAI**

**The Authority, in its Recommendations of September 2013 on 'Valuation and Reserve Price of Spectrum', had recommended that the SUC for all auctioned spectrum should be at a flat rate of 3% of AGR for wireless services. For the transition phase, till the time the entire spectrum is converted into auctioned spectrum or acquired in spectrum trading or on which the TSP has paid the prescribed market value, the Authority recommended a highest slab rate of 5% of AGR. In this regard paragraphs 5.31, 5.33, 5.35 and 5.37 of September 2013 Recommendations may be perused. The Authority's Recommendations are not restricted to any particular spectrum band. The Authority reiterates its recommendations of September 2013 on SUC.**

**(ii) Payment for liberalised/Contiguous spectrum**

**DoT's view**

It is felt that for making the charging principle for liberalized spectrum, clear in the NIA, following issues need to be addressed

a) What price is to be charged from an operator for making the existing spectrum liberalised.
b) Whether the operator who had been awarded spectrum in auction held in March 2013 is to be charged for making spectrum contiguous and, if so, at what rate?

**Response of TRAI**

**The issues raised at (a) and (b) above are in the nature of additions to the DoT's previous reference of 12th December 2013 on valuation and reserve price of 800 MHz spectrum. At that juncture, these issues were not posed to the Authority for a recommendation. Both the issues have arisen from the NIA which the DoT framed on its own for auction of spectrum. The Authority reiterates its views as below:**

**(a) The Authority in its Recommendations of September 2013 on 'Valuation and Reserve Price of Spectrum' had made recommendations on issues related to liberalisation of existing spectrum holding (See paragraph 2.76 of the Recommendations). The Authority reiterates its recommendations of September 2013 on liberalisation of existing spectrum holding for 800 MHz spectrum also.**

**(b) As explained above, the valuation exercise for 800 MHz spectrum done by the Authority was based on the relative technical efficiency compared to the 1800 MHz band/900MHz band as well as on approaches based on economic/commercial factors without any bearing on the availability of spectrum in contiguous or non-contiguous form (Please see response at paragraph 4.3 (iii and vi) above).**

**Annexure - A**

## PROJECTED GROWTH RATES

| Year | Growth of subscribers | Growth of Voice MOU per subscriber per month | Growth of SMS per subscriber per month | Growth of Data Download per subscriber per month | Growth of ARPU per month |
|---|---|---|---|---|---|
| 2015 | 4.0% | 0% | 0% | 20% | 5% |
| 2016 | 4.0% | 0% | 0% | 20% | 5% |
| 2017 | 3.5% | 0% | 0% | 16% | 4.5% |
| 2018 | 3.0% | 0% | 0% | 16% | 4.5% |
| 2019 | 2.5% | 0% | 0% | 12% | 4.5% |
| 2020 | 2% | 0% | 0% | 12% | 4% |
| 2021 | 2% | 0% | 0% | 10% | 4% |
| 2022 | 1.5% | 0% | 0% | 10% | 4% |
| 2023 | 1% | 0% | 0% | 10% | 4% |
| 2024 | 1% | 0% | 0% | 8% | 3% |
| 2025 | 1% | 0% | 0% | 8% | 3% |
| 2026 | 1% | 0% | 0% | 8% | 3% |
| 2027 | 1% | 0% | 0% | 6% | 3% |
| 2028 | 0.5% | 0% | 0% | 6% | 3% |
| 2029 | 0.5% | 0% | 0% | 6% | 3% |
| 2030 | 0.5% | 0% | 0% | 4% | 3% |
| 2031 | 0.5% | 0% | 0% | 4% | 2% |
| 2032 | 0.5% | 0% | 0% | 4% | 2% |
| 2033 | 0.5% | 0% | 0% | 2% | 2% |
| 2034 | 0.5% | 0% | 0% | 2% | 2% |
| 2035 | 0.5% | 0% | 0% | 2% | 2% |

**Annexure – B**

## VALUATION (PER MHz) USING DIFFERENT APPROACHES – 800 MHz

**(Rs. in crore)**

| Name of LSA | 1.5 times of Price of 1800 MHz band* | 2 times of Price of 1800 MHz band* | Producer Surplus Model | Model based on projected revenue from data services | Auction (Feb. 2014) determined price of 900 MHz | Mean of all approaches (Average Valuation) | 80% of Average Valuation (Reserve Price) |
|---|---|---|---|---|---|---|---|
| Delhi | 546.00 | 728.00 | 619.32 | 451.45 | 740.96 | **617.15** | **493.72** |
| Mumbai | 408.00 | 544.00 | 441..07 | 241.25 | 563.09 | **439.48** | **351.59** |
| Kolkata | 109.50 | 146.00 | 178.18 | 106.03 | 194.63 | **146.87** | **117.49** |
| Andhra Pradesh | 253.98 | 338.64 | 173.07 | 169.33 | - | **233.76** | **187.00** |
| Gujarat | 356.70 | 475.60 | 167.98 | 97.94 | - | **274.56** | **219.64** |
| Karnataka | 277.13 | 369.50 | 354.51 | 210.84 | - | **302.99** | **242.40** |
| Maharashtra | 435.53 | 580.70 | 167.26 | 174.26 | - | **339.44** | **271.55** |
| Tamilnadu | 338.11 | 450.82 | 470.25 | 182.14 | - | **360.33** | **288.26** |
| Haryana | 59.75 | 79.67 | 26.19 | 23.11 | - | **47.18** | **37.74** |
| Kerala | 140.79 | 187.71 | 92.71 | 74.60 | - | **123.95** | **99.16** |
| Madhya Pradesh | 129.05 | 172.07 | 66.72 | 85.40 | - | **113.31** | **90.65** |
| Punjab | 132.57 | 176.76 | 50.44 | 64.78 | - | **106.14** | **84.91** |
| Rajasthan | 161.04 | 214.72 | 115.10 | 129.68 | - | **155.13** | **124.11** |
| U. P. (East) | 182.48 | 243.31 | 178.54 | 64.47 | - | **167.20** | **133.76** |
| U.P. (West) | 142.43 | 189.90 | 88.49 | 53.44 | - | **118.56** | **94.85** |
| West Bengal | 65.85 | 87.80 | 79.46 | 49.77 | - | **70.72** | **56.58** |
| Assam | 54.15 | 72.20 | 2.20 | 9.94 | - | **34.62** | **27.70** |
| Bihar | 115.33 | 153.78 | 88.02 | 69.27 | - | **106.60** | **85.28** |
| Himachal Pradesh | 17.78 | 23.71 | 42.39 | 11.54 | - | **23.86** | **19.09** |
| Jammu & Kashmir | 46.17 | 61.57 | 26.15 | 4.54 | - | **34.61** | **27.69** |
| North East | 39.50 | 52.66 | 6.94 | 6.53 | - | **26.41** | **21.13** |
| Orissa | 43.82 | 58.43 | 69.24 | 20.07 | - | **47.89** | **38.31** |
| **Pan India** | **4055.66** | **5407.55** | **3504.23** | **2300.39** | - | **3890.75** | **3112.60** |

* Value of 1800 MHz spectrum as per TRAI's Recommendations of 15th October 2014 on valuation and reserve price of spectrum (see Para 3.44).