Bharti Airtel's Response to TRAI's Consultation paper on "Reserve Price for Auction of Spectrum in the 800 MHz Band"

At the outset, we would like to thank the Authority for initiating this consultation exercise, and scheduling an open house discussion with the Industry on the 27th of January, 2014. We wholeheartedly support the Authority, in its efforts to value the 800 MHz spectrum carefully, and believe that a deeper study is definitely warranted.

Our stand on this subject mirrors our position on an earlier consultation exercise on the "Valuation & Reserve price of Spectrum" conducted by the Authority in July, 2013. The concerns and questions raised in this paper are not new to the Authority or the Industry, and are issues that have been addressed by both in the past. We stand by our earlier position, in that the most efficient use of this spectrum will be realized only if it is auctioned as 900 MHz E-GSM spectrum.

We would like to articulate some of the key issues that need to be considered before this spectrum is auctioned as 800 MHz.

I. **Demand for 800MHz is low:**

a. **Diminishing customer base for CDMA based mobile services and low demand for 800MHz spectrum:**

- The Authority is already aware that the subscriber base of CDMA has diminished by around 30% over a period of three years. On the contrary, the GSM subscriber base has increased by 65% over the same period. For the QE March 2013, the average revenue per user per month (ARPU) of CDMA services was Rs. 95 as compared to Rs. 105 for GSM services. Similarly, the minutes of usage per subscriber per month (MoU) of CDMA services was 275 as compared to 383 for GSM services.
- Due to a diminishing subscriber base, the spectrum held by CDMA operators is already in excess of the prescribed Subscriber Linked Criterion. We understand that one of the dual technology operators has in fact surrendered a part of 800MHz spectrum to DoT.
- Presently, there is hardly any demand for 800MHz spectrum. This is evident from this fact that in November 2012 auction, there was no participation in the bidding for 800 MHz band. This spectrum was again put up for auction in March 2013 after reducing the reserve price by 50%, which was even lower than 1800MHz. Inspite of this reduction, only one licensee took part in the auction and acquired spectrum only in eight LSAs.

Hence, it is evident that the auction of 800MHz only for CDMA is unlikely to attract many bidders.

b. **Inefficient utilization of spectrum in 800 MHz band:**

While CDMA is a more efficient technology than GSM, utilization of 800 MHz band remains far lower than 900/1800 MHz. The following table illustrates the value to society and fiscal contribution (as revenue to the exchequer) for both technologies.

S. No.	Parameter	GSM (1800MHz/ 900MHz)	CDMA (800MHz)	Efficiency of CDMA as compared to GSM
1	Subscriber per MHz	751,681	274,015	36.45%
2	Annualized Revenue in Rs. Crores per MHz (Basis AGR)	99.25	24.18	24.37%
3	Annualised radio spectrum usage charge in Rs. Crores per MHz	4.98	0.73	14.58%

Note:

i. Wireless GSM & CDMA subscribers are as reported by TRAI in its PMR Report for the quarter ending June 2013.

ii. Revenue figs are as per TRAI for quarter ended June 2013. The quarterly figs have been annualized for computational purposes.

iii. In case of dual technology operators, their Wireless AGR has been divided into GSM and CDMA in the proportion of their respective GSM and CDMA subscribers as on June 2013.

iv. The radio spectrum charges have been derived from the Industry data published by TRAI on GR, AGR, LF and WPC charges for the quarter ending June 2013. The quarterly figs have been annualized for computational purposes.

Therefore, it would be in the national interest to ensure that this spectrum is utilized efficiently, both technically and economically, which is not happening in the present scenario.

c. Low availability of 900 MHz band versus higher demand:

While the spectrum in 900 MHz band spans from 890 MHz – 915 MHz paired with 935 MHz – 960 MHz i.e. a total of 25 MHz paired, the actual availability of spectrum in 900 MHz is considerably lower, at around less than 20 MHz per service area. The following table lists the total spectrum in 900 MHz allocated to operators across all service areas.

S No	Circle	Total 900 MHz spectrum allocated to operators
1	A.P.	20.2
2	Assam	18.6
3	Bihar	18.6
4	Delhi	22.2
5	Gujarat	20.2
6	H.P	18.6
7	Haryana	18.6

8	J & K	18.6
9	Karnataka	20.2
10	Kerala	18.6
11	Kolkata	20.2
12	Maharashtra	20.2
13	MP	18.6
14	Mumbai	22.2
15	NE	19.4
16	Orissa	18.6
17	Punjab	21.8
18	Rajasthan	18.6
19	TN	20.2
20	UP (East)	18.6
21	UP(W)	18.6
22	WB	19.4
	Grand Total	**430.8**

From the above table, it is clear that 13 out of the 22 service areas have less than 20 MHz of spectrum in 900 MHz band. This scarcity has led to an increase in demand for spectrum in this band.

On the other hand, there is adequate availability of spectrum in bands higher than 1 GHz, with over 125MHz of spectrum available across all service areas in the 1800, 2100 and 2300MHz bands. This has naturally led to the employment of skewed economics in the allocation of this integral national resource.

Therefore, the dwindling subscriber base, inefficient utilization of CDMA spectrum as well as higher demand for 900MHz makes the auction of 800 MHz spectrum only for CDMA services unjustifiable. Therefore, it will be a prudent decision, both technically and economically to harmonize the vacant 800MHz spectrum and auction it as 900MHz band. The true value of spectrum in 800 MHz band will be recognized when, and only when it is auctioned as E-GSM MHz.

In fact, the Authority in its recommendations dated 9th September, 2013, agreed with this approach, and proposed the following:

> *2.98 Therefore, the Authority recommends that* ***the feasibility of adoption of E-GSM should be explored in a time-bound manner. The Authority also recommends that the auction in the 800 MHz band should not be carried out now.****"*

In summary, the auction of 800 MHz spectrum as E-GSM is a win-win for all stakeholders for the following reasons:

- The interest for acquiring 900MHz spectrum has been shown by GSM as well as CDMA operators from time to time. The harmonization of E-GSM band would give an equal opportunity to all stakeholders to acquire spectrum in 900MHz.
- The harmonization of E-GSM band will unlock the precious 800 MHz band from CDMA technology enabling its usage for newer technologies.
- It will bring more revenue to the exchequer while ensuring continuity of services to CDMA subscribers due to higher participation for auction in 900MHz.

II. Spectrum is scarce, invaluable, and can be used across technologies

The prevailing scarcity of sub 1 GHz spectrum makes it extremely valuable and any efforts to allocate this spectrum should be preceded by a thorough techno economic study of this band taking into account the following facts:

a. **Well Developed eco-system for 800MHz spectrum:** 800MHz spectrum is being commonly used for providing mobile voice and broadband services using latest technologies like WCDMA (3G) network and LTE in addition to the legacy technologies like CDMA-1X and EVDO.

   There are more than 50 networks serving more than 150 Million 3G subscribers. There are more than 1500 devices (representing 40% of the total 3G devices) supporting this band, clearly representing global harmonization of the band for 3G services. At present, this ecosystem is getting developed at a faster pace than the ecosystem in 900MHz band. Operators like AT&T, VIVO, Telefonica, America Movil, Telcel, Telstra, Clario, SKT, etc. who have been using the band for CDMA services in the past, are now using the same spectrum for offering 3G & LTE services in the North American, Latin American and Asian markets.

   The 800MHz band is also being used for LTE services. There are four operators, namely SKT, LGU+, MetroPCS, Leap wireless, who have launched LTE-FDD services using this spectrum and serving more than 10Million LTE subscribers. Globally, 190 LTE devices (including 100+ smartphone models) are available which support 800MHz band.

b. **Better propagation characteristics:** 800MHz spectrum has better propagation characteristics than 900MHz band.

c. **Limited availability of sub 1GHz band:** There is a limited spectrum (approx. 40MHz per circle in 800 & 900MHz band combined as compared to other bands) in sub 1GHz band.

In light of the above, it would be in the national interest to use a large part of spectrum in this band (in 800MHz band) efficiently, both technically and economically. Therefore, the government should harmonize 800 MHz band and make the 10 MHz of E-GSM band as a part of the overall 900 MHz band.

III. Harmonization of E-GSM is operationally feasible

The harmonization of E-GSM is operationally feasible. CDMA operators concerns that the conversion of 800 MHz band into E-GSM will negatively impact the continuity of service, adversely affect investments made by CDMA operators, infringe on the legal rights of these operators, and negatively impact the subscriber base of PSUs is completely unfounded as explained below:

a. No adverse impact on continuity of service

Harmonization of E-GSM will not deny CDMA operators the use of their assigned spectrum, as the process only involves shifting of frequencies assigned from one operator to another in the same band. In fact, such activity is routinely carried out by the WPC. During November 2012 auction, Airtel along with other operators was asked by WPC to shift their existing frequencies spots in 1800 MHz band to facilitate contiguous spectrum for auction.

b. No adverse impact on existing investments

CDMA operators are also concerned that harmonization will have a negative impact on their existing investments. This is clearly not true, since these operators can continue to offer services on a different set of frequencies within the same band. This exercise would involve the retuning of a small number of RF filters, the cost of which would be negligible compared to the benefits that would accrue to society from unlocking this spectrum from 800 MHz band.

c. No adverse impact on legal rights of CDMA operators

Harmonization will neither reduce the amount of spectrum held by these operators, nor will it change the allocated spectrum band. Therefore, the legal rights of CDMA operators will continue to be protected.

d. Pragmatic solution for the issues related to surrendering of spectrum by Defence and captive users:

With respect to the issue of vacating spectrum from 925 MHz -935 MHz from defence agencies as well as other captive users and using it for EGSM, we wish to state the following:

i) **Around 7MHz is being used by Defence**:

DoT in its response to the Authority dated 20th Dec, 2013 states

"Defence has intimated that due to operational requirements, it is not feasible to migrate the equipment to other bands in a definite time frame"

We believe that the issue of spectrum holdings to the amount of 7 MHz by Defence should be deliberated upon further. This 7 MHz may not be employed for cellular networks or any other pan India system. At the most, these 900MHz frequencies are used in some confined areas/geographies, and can be utilized for cellular mobile services across the country except in the few areas identified by Defence in co-ordination with the WPC.

ii) **448 assignments to different users for captive use:**

We understand that 448 assignments for captive use would either be point-to-point connectivity or point-to-multipoint connectivity with at the most 1 transceiver. These 448 transceivers or point-to-point links by captive users is miniscule when compared to the huge number of BTSs deployed for cellular mobile services across the country. The non-availability of E-GSM spectrum in a few pockets should not deter its use in a majority of locations. Such practices have been adopted in the past in other frequency bands as well, i.e. 1800 MHz/2100 MHz where the assigned spectrum was not made available in few pockets of a particular service area. Thus, once the E-GSM is put up for auction, interested bidders can always take informed decisions. Nevertheless, the government may move these captive users to alternate media.

We propose that a special multi-disciplinary committee comprising defence personnel, and members of the DoT, the TRAI and the industry be selected and tasked to work out the specifics of surrendering this spectrum in selected locations as well as conversion of 800MHz into E-GSM.

IV. Summary

Since spectrum in 800MHz band can be used for multiple technologies, any allocation of this spectrum for only CDMA would result into locking it for the next 20 years. It is therefore imperative to have a clear roadmap for allocation and harmonization of this spectrum.

The industry is in dire need of clarity and affirmative action from the Authority as well as the government, especially in the management of this resource.

Our responses to the questions raised by the Authority are included below:

Q1. What should be the quantum of spectrum in the 800 MHz band that should be put up for auction?

Bharti Airtel's Response:

We would like to allude to our stand above, i.e. this spectrum should be auctioned as 900 MHz E-GSM and not 800 MHz.

In the event that this spectrum absolutely has to be auctioned as 800 MHz, we propose the following:

- All available spectrum in 800 MHz band, including the spectrum vacated by M/s TTSL and excess spectrum with BSNL/ MTNL be auctioned.
- At least 5 MHz of contiguous spectrum should be made available in all LSAs where spectrum is to be auctioned

(Annexure – I indicates that at least 5 MHz of spectrum in 800 MHz can be made available in all circles except Kolkata and Rajasthan)

Q2. What should be the block size in the 800 MHz band?

Bharti Airtel's Response:

In respect of block size and the eligibility to bid, the following is proposed:

a. Block size should be 1.25 MHz
b. New Entrants or existing operators who do not currently hold spectrum in 800 MHz will have to bid for at least 4 blocks (i.e. 5 MHz) of spectrum.
c. Existing operators who currently hold spectrum in 800 MHz can bid for a minimum of 1 block (i.e. 1.25 MHz).
d. 800 MHz spectrum that is allocated via this auction can be combined with existing spectrum in 800 MHz for providing services other than CDMA, only after existing spectrum holdings are paid for at auction determined price prorated for the remaining validity of the original assignment. **This principle should also be followed for spectrum allocated at the end of the March, 2013 auctions since the sole argument cited for reducing the price of 800 MHz spectrum was the fact that the quantum of spectrum was less than 5 MHz and hence cannot be utilized for newer technologies (3G/LTE etc.) other than CDMA.**

Q4. Is there any case for application of a lower efficiency factor (1.3) over the valuation of 1800 MHz spectrum, for determining the valuation of 800 MHz, as was done in the previous auction? If yes, give detailed reasons for the same.

Bharti Airtel's Response:

There is no case for the application of a lower efficiency factor over the valuation of spectrum in 1800 MHz band, for determining the valuation of spectrum in 800 MHz band.

In case such an approach is adopted, the same should apply to the auction of 1800 MHz spectrum in February, 2014 since it would be non-contiguous and less than 5 MHz, making it less efficient.

However, it has been clearly stated by the DoT in the NIA that the price of spectrum in 1800 MHz will be the same irrespective of it being less than 5 MHz or non-contiguous. No opportunity has been granted to the bidder to deny the spectrum in case it bids for 5 MHz and is allocated less.

Q3. Should the value of 800 MHz spectrum be derived on the basis of the value of 1800 MHz spectrum using technical efficiency factors?
&
Q5. Should the value to be paid for 800 MHz spectrum be based upon the potential growth in data services? If yes, please state whether you agree with the assumptions made.
&
Q6. Should the value of spectrum in the 800 MHz band be assessed on the basis of producer surplus on account of additional spectrum? If you are in the favour of this method, please furnish the detailed calculations and relevant data along with results.
&
Q7. Should the value of spectrum in the LSAs in India for 800 MHz be determined by utilizing the data on international prices? What other variables do you suggest for arriving at robust value estimates using the multiple regression approach? Is there any alternate approach for valuation of spectrum in 800 MHz using the data on international auctions?
&
Q8. Apart from the approaches discussed in the paper, is there any alternate approach for valuation of spectrum in 800 MHz that you would suggest? Please support your answer with detailed data and methodology.

Bharti Airtel's Response:

We have already submitted our views on methods to value the spectrum vide our response to the Consultation paper floated by the Authority on "Valuation and Reserve Price of Spectrum" and the same is enclosed as **Annexure – II.**

We herein re-iterate that all spectrum allocated for mobile communication be valued consistently so similar services provided using different spectrum bands are priced similarly.

We also wish to submit that while the Authority may use any valuation method, the same should be used consistently for valuing all bands. It may also be worthwhile to mention that:

- Spectrum in 800 MHz band has even better propagation characteristics than spectrum in 900 MHz band.

- As per the ecosystem of devices/ equipment available, spectrum in 900 MHz band can be used for either GSM or WCDMA, while spectrum in 800 MHz band can be used for CDMA, WCDMA as well as LTE technologies.

Considering the above, the value of spectrum in the 800 MHz band should be equal, if not more than the value of spectrum in the 900 MHz band.

It is also important to note that by the time networks are deployed in the next 2-3 years, the device ecosystem in 800 MHz band for various technologies will also improve and spectrum in 800 MHz band would be more valuable and efficient than spectrum in the 900 MHz band.

Q9. What should be the ratio adopted between the reserve price for the auction and the valuation of the spectrum? Would it be optimal to fix reserve price equal to valuation of spectrum?

Bharti Airtel's Response:

Given the superior propagation characteristics of 800 MHz spectrum over 900 MHz spectrum, the reserve price for the 800 MHz band should be **equal, if not more than** the reserve price for the 900 MHz band.

Annexure – I

S. No.	LSA	Total No. of Carriers	Carriers presently allocated to					Total Carriers Allocated	Total Carriers available as on date	Crriers to be got surrendered from MTNL/ BSNL	Carriers to be surrendered by TTSL	Additional carriers availble post surrender by MTNL/ BSNL/ TTSL	Total Carriers available post surrender by MTNL/ BSNL/ TTSL
			BSNL/ MTNL	SSTL	TTSL	RCI/ RTL	HFCL						
1	Delhi	14	2	3	4	4	-	13	1	2	1	3	4
2	Mumbai	14	2	-	4	4	-	10	4	2	1	3	7
3	Kolkata	13	2	3	3	4	-	12	1	1	1	2	3
4	Maharashtra	14	2	-	4	4	-	10	4	1	2	3	7
5	Gujarat	14	2	3	3	3	-	11	3	1	1	2	5
6	Andhra Pradesh	13	2	-	3	4	-	9	4	1	1	2	6
7	Karnataka	14	2	3	3	4	-	12	2	1	1	2	4
8	Tamilnadu	14	2	3	3	4	-	12	2	1	1	2	4
9	Kerala	14	3	3	3	4	-	13	1	2	1	3	4
10	Punjab	13	2	-	3	3	2	10	3	1	1	2	5
11	Haryana	14	2	-	3	3	-	8	6	1	1	2	8
12	UP (West)	14	2	3	3	4	-	12	2	1	1	2	4
13	UP (East)	14	2	-	3	4	-	9	5	1	1	2	7
14	Rajasthan	12	2	4	3	3	-	12	-	1	1	2	2
15	Madhya Pradesh	13	2	-	2	4	-	8	5	1	-	1	6
16	West Bengal	14	2	3	2	3	-	10	4	1	-	1	5
17	Himachal Pradesh	14	2	-	2	2	-	6	8	1	-	1	9
18	Bihar	14	2	-	3	4	-	9	5	1	1	2	7
19	Orissa	14	2	-	2	3	-	7	7	1	-	1	8
20	Assam	14	2	-	-	2	-	4	10	-	-	-	10
21	North East	14	2	-	-	2	-	4	10	-	-	-	10
22	J&K	14	2	-	-	2	-	4	10	-	-	-	10
	Total Carriers	**302**	**45**	**28**	**56**	**74**	**2**	**205**	**97**	**22**	**16**	**38**	**135**
	Total Spectrum (MHz)	**377.50**	**56.25**	**35.00**	**70.00**	**92.50**	**2.50**	**256.25**	**121.25**	**27.50**	**20.00**	**47.50**	**168.75**

1 Carrier denotes 1.25 MHz paired spectrum