The Advisor (Networks, spectrum & Licensing)
Telecom Regulatory Authority of India,
Mahanagar Doorsanchar Bhawan,
Jawahar Lal Nehru Marg (Old Minto Road),
New Delhi-110002

Kind Attn. : Sh. Arvind Kumar

Sub: TRAI's Consultation on 'Valuation and Reserve Price of Spectrum: Licenses expiring in 2015-16' dated the 7th Aug, 2014

Dear Sir,

At the outset, we welcome the Authority's initiative to release this detailed Consultation Paper.

Spectrum is a scarce resource for mobile networks and the issue of "sufficient spectrum availability" for mobile services at the "right price" is central to the growth of these services in the country.

· With a total of over 790 million VLR subscribers and new additions of approx. 65 to 70 million every year, the telecom industry has provided yeoman service in "connecting the unconnected' and adding substantially to the GDP of the country.

· The TRAI Consultation Paper comes at a critical juncture, where 29 Licenses are due for extension. The Authority has rightly pointed out in para 2.5 at page 9 of the consultation that "*the Authority is of the view that before conducting the auction, the Government should explore the possibility of making available one additional block of 5 MHz contiguous spectrum in the 900 MHz band.……".*

· With limited or no availability of 1800 MHz fall back spectrum, the country runs the risk of effectively 'blacking out' over 280 million VLR users (as per last TRAI VLR Report June 2014) who are dependent on the existing licensees for GSM mobile services.

· These licensees have the highest number of subscribers per unit of spectrum, at an average of 1.33 million subscribers per MHz, and are by far the most efficient users of this scarce resource.

· The combination of lack of fall back spectrum in 1800 MHz , its contiguity, and the fact that in many areas only 'partial' allotment is available would be a deathblow to the customers, the operators, and to the country as a whole.

· These are among the issues that have been rightly highlighted by the Authority in the Consultation Paper, and we compliment the authors for their foresight in raising the right issues for debate.

While we recognize that the proposed auction for licenses expiring in 2015-16 violate the Government commitment made in NTP 99, existing license conditions, and even the Government's own Press Release of February 2012, **we are submitting our detailed response on all the issues, while also suggesting a 'way forward' in the interest of all the stakeholders.** We are confident that our submissions will be taken into consideration while preparing the final Recommendations to the Government.

Please find enclosed herewith our submission as **Enclosure A** in response to the Authority's Consultation Paper. A hardcopy of our submission has been sent separately.

Should you require any clarifications or further information on the positions set out in this response, please do not hesitate to contact us.

Thanking You,

Regards,

Rahul Vatts
Vice President – Regulatory & Corporate Affairs
IDEA Cellular Limited
7th Floor, Konnectus,
Bhavbhuti Marg, New Delhi – 110 001.

e-mail : rahul.vatts@idea.adityabirla.com
Cellular : +91 98910 05951 ::: Landline : +91 11 2321 0134/35/336 Ext. – 5951 ::: Fax : +91 11 23210138

ENCLOSURE A

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Idea Cellular Response on TRAI consultation paper dated 07/08/2014

Introduction

1. At the outset, Idea Cellular compliments the Authority for bringing out a detailed consultation paper on the issue of spectrum valuation and also highlighting issues related to the subject.
2. You may kindly note the issue of extension of licenses is presently sub-judice and Hon'ble Supreme Court, while admitting our Appeal No. 5376 of 2014, has listed the matter for final hearing on 26/11/2014. Additionally, our Appeal on *ensuring similar/uniform terms and conditions in all auctions and to prevent disruption of services has been filed in Supreme Court. Our submissions below are without prejudice to our contentions highlighted in these two Appeals.*
3. During the last TRAI consultation on this subject, Idea had specifically highlighted in detail, the issues involving extension of licenses and continuity of services. However these were not addressed in final TRAI recommendations and subsequently DoT too failed to address them.
4. **The current Consultation Paper (para 2.3 at page 8) has acknowledged the following on Licenses expiring in 2015-16 - "*The Auction poses a very real problem for incumbent licensees i.e. the very continuity of their service in an Area is subject to the outcome of the auction".* The TRAI in para 2.5 at page 9 of the consultation paper goes on to suggest that the DoT should explore making more spectrum available before conducting the auction;"**
5. **Though we welcome the TRAI's acknowledgement of the issues of continuity of services, we are however deeply concerned that the Consultation Paper, while raising the issues, has suggested only half measures and has thus failed to fully address the issue of continuity of operations of existing licensees (whose license is due for extension) and consequent impact on more than 280 million VLR subscribers (as per last TRAI VLR Report June 2014)who depend on these existing licensees for mobility services.**
6. **Before responding to specific queries raised by TRAI, we are giving below our key submissions which address the subject comprehensively under the following broad framework –**
   - **A. Need for the Proposed Auction**
   - **B. Proposed Auction is very different from Feb'14 auctions**
   - **C. Government Policy and adverse impact of proposed auction vis a vis policy objectives**
   - **D. Proposed Auction violates License Agreement and government policy and pronouncements**
   - **E. Our Proposals to address the issues**

A. Need for the Proposed Auction

The Authority firstly needs to be clear about the objectives of the proposed auction. As per us, this subject can be covered in three sections:

1. Objectives as stated in the NIA for auctions held in Feb'14

The objectives as stated in the NIA for the Feb'14 auction are given below. None of the objectives of auction held in February 2014 (as listed in NIA) are relevant for the proposed auction as has been explained with applicable objective below:

Obtain a market determined price of Spectrum in 1800MHz and 900MHz bands

This is no longer a relevant objective, as there have been two auctions - in Nov'12 and again in Feb'14 where 1800 MHz spectrum has been auctioned in all circles. There has also been an 800 MHz auction in Mar'13. The prices discovered in these auctions, with some adjustments for outliers and applying factors based on technical efficiency and technologies for which the spectrum band is deployed, can be used to determine fair value from market price of same or comparable spectrum. It is not possible that an auction is carried out for each price discovery. There will be extensions coming up almost each year and it is neither practical nor desirable to have auctions every time and so frequently. **Hence, auction as a means of addressing extension of expiring licenses is not a viable proposition**.

It must also be emphasised that an auction is conducted for two reasons – one is for price discovery and the other is to ascertain as to who should get the asset (spectrum in this case). In case of new spectrum, which is being brought to use for the first time, both reasons apply. However, in case of spectrum which is already allocated to an operator, the allocation is already made and the fair value can be determined as explained in the first para. Hence, for spectrum available with existing licensees, neither of the 2 reasons are relevant and hence an **auction is not required**.

More importantly conducting auctions when very few licenses (as few as 1 or 2 in a year) are due for extension after expiry, is not feasible. **The Authority thus needs to seriously consider as to how the issues in extension of existing licenses need to be addressed** – we cannot have a situation where some spectrum associated with some expiring licenses is auctioned today and in future in other cases it is extended based on fair value. Hence, it is essential that spectrum already allocated is not auctioned, but only extended based on fair value of spectrum. It is also best to make all the licenses co-terminus to avoid these issues, which would keep coming up with different licenses expiring and becoming due for extension at different times. We have provided International examples of decisions taken by some Regulators on extending licenses to make them co-terminus in **Annexure G**.

Ensure efficient use of spectrum and avoid hoarding

The private existing licensees due for extension are actually the most efficient users of the spectrum, as they have the largest number of subscribers and traffic on their network. This can be studied from **Annexure A**, where it can be seen that for all 29 licenses **the existing licenses due for extension have the highest number of subscribers per unit of spectrum at an average of 1.33 million subscribers per MHz of spectrum, as against a figure of only 0.32 million subscribers per MHz for BSNL.** In fact if the existing licenses due for extension lose their spectrum and a new owner has to roll out a fresh network on the same spectrum, the most efficiently utilised spectrum will be removed from the system and it will take a long time before network is set up and then subscribers come on such spectrum. Hence the auction in a scenario of spectrum moving from existing licensees due for extension to another licensee will actually result in inefficient use of spectrum.

Stimulate competition in the sector

There are only two possibilities in an auction scenario. Either the spectrum is won by the existing licensees due for extension, in which case there is no change in competition dynamics. However, in the other scenario of the existing licensees due for extension not being able to win the spectrum in the auction, one player will go out of business and the new winner of the specific spectrum block will take a long time to roll out a network and provide services. Hence, if this is the auction result, in the interim period, the auction will result in reduction of competition in the GSM services segment on which 92% of subscribers currently depend (this is based on Idea's current data where even after over 4 years of 3G spectrum being available in India, only ~8% of the total subscribers actually use 3G services).

Promote rollout of the respective services

As already explained earlier the existing licensees due for extension have the widest existing network which has been rolled out over the past 20 years in any given circle. In the event they fail to win the spectrum in the auction, they will be forced to discontinue their services and their network will become redundant. This will significantly reduce the coverage as any new winner of spectrum will take a long time to launch services in the first place and they will take several years to match the extent of rollout which incumbent licensees have achieved over 20 years. Hence, the auction will result in shrinking of coverage. This is explained in greater detail later in section C.2 (para 2), where based on sample analysis of 4 LSAs it is seen that, if the 900 MHz GSM networks of private operators discontinue operations due to failure to win 900 MHz spectrum, then almost 45% of towns and villages in this sample of LSAs would lose coverage.

As per Analysys Mason report (Annexure D), even if the incumbent licenses were to get 1800 MHz spectrum in place of 900 MHz spectrum, "*the overall process of migration from 900MHz to 1800MHz may take up to three years for completion, during which the quality of service will be severely hit*". Further, as the Authority has already acknowledged in the consultation, in the proposed new auction, even the quantities of 1800 MHz are insufficient.

Maximise revenue proceeds from the Auctions within the set parameters

As explained above a fair value of the spectrum has been ascertained through earlier auctions and the revenue for the government will not be very different whether the fair value is determined based on last three auctions or a new auction is carried out. **We have also worked out the revenue that the government will earn in case the licenses were extended based on fair value** (refer Annexure B to study basis of deriving fair value) in the following scenarios (please refer Annexure C for details) –

(i) Extension of licenses to be co-terminus with BSNL licenses with contiguous blocks of 5 MHz or more made available to licenses due for extension – Rs.4,977 crs.

(ii) In case the spectrum in 900 MHz is not in contiguous blocks of 5 MHz, then based on a lower value of such blocks, the potential revenue for the government will be Rs.3,318 crores.

(iii) **In any case after a period of 4 years when all licenses have become co-terminus, the revenue that the government will earn (assuming that once all licenses are made co-terminus and all 900 MHz spectrum becomes available at the same time we will be able to get all 900 MHz spectrum in contiguous blocks), the extension of 29 licenses for 20 years (comparable with auction scenario of 20 years period) will yield a revenue of about Rs.24,000crores. At that time there will be more**

licenses due for extension including those for BSNL and hence the total revenue will be much higher than the figure mentioned hereinabove which is attributable to only the 29 licenses.

Hence, as can be seen the revenue is maximised even in case of extension of licenses and payment can be made by the licensees on the same deferred payment terms as stipulated for the Feb'14 auction.

It may be noted that there is always a trade-off between investment in spectrum and network rollout and hence increasing spectrum cost beyond a certain point will be counterproductive in terms of lesser rollout, lesser revenues for the operator and lesser license fee revenue and spectrum usage charges for the government. Besides the loss of recurring revenue, it will also prevent the furtherance of policy of rural coverage.

Hence, as can be seen that the proposed auction will not serve any of the objectives specified for the earlier auctions and in the event of the incumbent licensee failing to win the spectrum, it will work against the objectives of efficient use of spectrum, promotion of competition and rollout of services.

2. Reference from DoT

DoT's letter dated April 17, 2014, has requested TRAI to recommend reserve price for auction of 900 MHz and 1800 MHz in light of some the licenses expiring during December, 2015 to early 2016. As stated at other places in the document an auction is not required for extension of licenses as per the terms of License Agreement which provide for extension on mutually agreed terms. Hence, the whole basis of seeking a reserve price for an auction is flawed.

It will in fact be more appropriate for TRAI to recommend a fair value of spectrum for extension of licenses based on the Feb'14 auctions, as explained in greater detail later..

3. Other possible Objectives

We have considered as to what could be the other possible objectives of the proposed auction and have given our views for each of them.

a. Extension of Licenses – as far as this is concerned, the license already provides for an extension of 10 years on mutually agreed terms. Hence, an auction is not required for this purpose.

b. It can be argued that to arrive at a fair price for extension price discovery needs to be made. In this regard, based on the preceding multiple auctions of 1800 MHz, sufficient price discovery has happened and the same can be used (after making suitable adjustments for some outliers where the price was abnormally high because of extremely limited availability of spectrum – please refer Annexure B for our assessment of fair value). Hence, fair price of 1800 MHz spectrum is clearly established. The price of 900 MHz can be easily extrapolated based on 1800 MHz price. We believe that a multiple of 1.5x to the fair value of 1800 MHz is a reasonable way to derive the fair value of 900 MHz spectrum. Also the price discovery of 800 MHz has been made in several circles and that can also be used to arrive at a value for 900 MHz spectrum as 800 MHz is more efficient than 900 MHz, a simple law of physics. Hence the objective of this auction cannot be the price discovery for the purpose of extension, as sufficient data is available from previous auctions to determine the same.

c. The only other objective of the auction can be to release 900 MHz spectrum for deployment of new technologies (3G in this case). The first point to be noted in this regard is that there is adequate 2100 MHz spectrum available between the DoT and Defence to cater to the requirements for 3G and various proposals have been highlighted by Industry in this regard. The TRAI should recommend immediate release and auction of 2100 MHz and then the auction of 900 MHz, if any (in our opinion no auction of 900 MHz is required unless an extra block for a new operator can be created with additional spectrum), can be held concurrently.

However, despite the above, if there is a need to release some 900 MHz for 3G, it cannot be based on taking away 900 MHz spectrum from current holders of 900 MHz (existing licensees due for extension) who have invested in networks on that frequency band over the last 20 years. It also cannot be based on any scenario where there is inadequate total spectrum available (including 1800 MHz) for continuation of GSM services by the existing licensees of 900 MHz. Hence, if the objective of the auction is to release 900 MHz spectrum for new technologies, the following conditions need to be fulfilled.

(i) **For 3G deployment on 900 MHz a contiguous block of at least 5 MHz is required. For continuation of GSM services on 900 MHz at least 4.5 MHz spectrum is required (this will be the base spectrum and in any case additional 1800 MHz will be required for capacity purposes).** Hence, the minimum availability of 900 MHz spectrum in an LSA for being able to release a single block for 3G will be as under in the following two scenarios –

- **LSAs where one license is expiring** - 9.5 MHz (4.5 MHz for GSM and 5 MHz for 3G)

  There are 7 LSAs (Assam, Bihar, Orissa, Tamil Nadu, UP East, UP West, West Bengal) where a single license is coming up for extension and none of these LSAs have a minimum of 9.5 MHz of 900 band spectrum.

- **LSAs where two licenses are expiring** - 14.0 MHz (2x4.5 MHz for GSM and 5 MHz for 3G)

  There are 11 LSAs where 2 licenses are coming up for extension and only 5 of these LSAs (AP, Gujarat, Karnataka, Maharashtra and Punjab)have a minimum of 14 MHz of 900 band spectrum.

Based on this criteria, auction for 900 MHz is feasible in only 5 out of 18 LSAs which have expiring licenses.

(ii) **Secondly besides availability of 4.5 MHz in 900 MHz band, additional 1.7MHz is the minimum requirement in 1800 MHz for being able to handle the current subscribers that each of the existing licensees due for extension need to manage. Hence, the minimum availability of total spectrum (including 1800 MHz) has to be at least 17.4MHz (2x6.2MHz for GSM and 5 MHz for 3G).** Out of the 5 circles mentioned in c (i) above, only 1 circle has the minimum 17.4 MHz of spectrum available. However, if some more spectrum can be made available either in 900 MHz or 1800 MHz band in the remaining 4 circles (out of 5), auction may be possible in 5 circles (out of 18 where licenses are coming up for extension).

Hence, based on above submissions, in our view renewal auction is feasible only in 5 LSAs(with at least 14 MHz 900 band spectrum and 17.4MHz total spectrum) out of 18, unless more spectrum is made available. Our specific suggestions to carry out the auction in these 5LSAs (AP, Gujarat,

Karnataka, Maharashtra and Punjab) and to address the issue in the remaining 13 LSAs are given later.

d. For the sake of completeness, the only other objective that could be attributed for the auction could be to have a new entrant for offering GSM services in 900 MHz. Here also we hope that it is not the intention of the government / regulator to get a new entrant by depriving an existing licensee due for extension of the required GSM spectrum for continuity of operations and hence this also cannot be the basis of conducting this auction.

Thus on the issue of "objectives for the auction", we conclude as under –

1. **There is absolutely no need for conducting auctions for the purpose of extending expiring licenses. Licenses can be extended based on mutually agreed terms as per provisions of the License Agreement;**

2. **The requirements of 3G spectrum can be fulfilled by making more 2100 MHz available. It may be noted that the last auction of 2100 MHz spectrum happened more than 4 years ago in May'10 and since then the operators have been waiting for more 2100 MHz spectrum to be released for 3G. Since this has not happened, in absence of any other option operators try to seek 900 MHz spectrum instead of 2100 MHz for 3G, as witnessed in Feb'14 auctions. Hence, it is essential to first release and auction 2100 MHz before considering any auction of 900 MHz spectrum.**

3. **In para 2.5 at page 9 of consultation paper the authority has rightly recognised the constraint of spectrum availability while stating that "the Authority is of the view that before conducting the auction the Government should explore the possibility of making available one additional block of 5 MHz contiguous spectrum in the 900 MHz band in the 6 LSAs by (a) redistributing the spectrum amongst TSPs and other Government users to make 5.6 MHz of spectrum in Punjab LSA contiguous and (b) make additional spectrum of 1 MHz in Maharashtra, Gujarat, Andhra Pradesh, Karnataka and 0.6 MHz spectrum in West Bengal in the 900 MHz band so as to make available one additional block of 5 MHz in these LSAs."**

   Out of the 6 LSAs mentioned here, we have also identified 5 LSAs out of the above and dealt with them in para "3c"above. However, the Authority's view about West Bengal is not quite correct as currently there are 3 licensees holding 4.4 MHz each and an additional block cannot be created by getting 0.6 MHz. If we exclude West Bengal from the list, then there are 13 circles, where auction should not be attempted at all. The Authority has not addressed the issue with regard to these 13 circles. Hence, we are covering the total subject of 18 circles in the following para.

   If despite what is stated in point 1 and 2 above it is felt that auctions need to be done, then given the current availability of spectrum, auction is feasible only in 5 LSAs (AP, Gujarat, Karnataka, Maharashtra and Punjab). For the remaining 13LSAs (Assam, Bihar, Tamil Nadu, UP East, UP West, West Bengal, Haryana, Himachal Pradesh, North East, Madhya Pradesh & Chattisgarh, Orissa, Rajasthan and Kerala), either more spectrum in the 900 MHz band has to be made available now from other sources or all licenses in these 13 license areas should be extended till the time BSNL licenses come up for renewal in 2020 when more spectrum in 900 MHz will automatically become available.

It may be noted here that the sources for additional 900 MHz spectrum could be as under –

- **Other non-telecom users of 900 MHz spectrum**
- **E-GSM spectrum: The TRAI, in its earlier recommendation dated 09.09.2013 had already recommended to DoT on need to check the feasibility for adoption of E-GSM band. In fact we had submitted earlier that with declining CDMA subscribers/ usage and in order to address issues of continuity of 900 MHz subscribers as also for providing opportunities for growth of broadband, the E-GSM band should be immediately put up for auction. In this regard submission of COAI to DoT vide their letters dated 19.09.2013 and 30.10.2013 are enclosed for reference [Annexure F.1 and F.2]. We re-emphasize that E-GSM band can go a long way in addressing the issues of spectrum shortage in 900 MHz while ensuring optimum utilisation of this scarce spectrum.**
- **From BSNL, which currently has 6.2 MHz of 900 MHz band spectrum in all circles. It may be noted that BSNL currently has only 0.33 million VLR Subscribers / MHz in the 18 LSAs where licenses are expiring as compared to 1.33 million VLR Subscribers / MHz for 29 licensees whose licenses are expiring in Dec'15 and early 2016. One of the stated objectives of the last auction was efficient use of spectrum and avoid hoarding. To achieve this objective, it is essential that if the auction is held and the 900 MHz block size of existing licensees with much larger number of subscribers is reduced to 4.5 or 5 MHz, BSNLs holding of 900 MHz (with much lesser number of subscribers) should also be revised to the new block size of 4.5 or 5 MHz. It would be most absurd and ironical if an existing licensee due for extension loses its spectrum in the auction and has to discontinue its services altogether, just because DoT fails to release 1.2 / 1.7 MHz spectrum of unutilised spectrum in 900 MHz band from BSNL. BSNL subscribers can be easily serviced by remaining 4.5MHz of 900 MHz and 1.8 MHz of 1800 MHz. In fact if BSNL's spectrum is reduced to 6.2 MHz (900+1800) in each circle, they will still have only 0.49 million VLR subscribers / MHz, which is significantly lower as compared to 1.33 million VLR subscribers / MHz for the expiring licenses based on their current full spectrum allocation (please refer Annexure A.1 for details).**

4. **Any auction conducted in the 13 circles without adequate availability of 900 MHz spectrum will only result in predatory competition in the auction, which has been discussed in some detail later.**

IN SHORT THE QUESTION TO BE ANSWERED IS WHY IS THIS AUCTION REQUIRED AT ALL FOR SPECTRUM WHICH IS ALREADY ALLOCATED TO EXISTING LICENSEES AND IS BEING UTILISED MOST EFFICIENTLY? THERE IS NOTHING TO BE ACHIEVED, BUT THE POTENTIAL DISRUPTION OF SERVICES CAN BE DISASTROUS. AS HIGHLIGHTED GOVERNMENT CAN STILL GET MARKET PRICE OF SPECTRUM AND MEET REVENUE OBJECTIVE, JUST BY MAKING ALL LICENSES CO-TERMINUS AS SUGGSTED ABOVE.

B. Proposed Auction is different from the Feb'14 auctions

1. The proposed auction is very different from the Feb'14 auction for expiring licenses, as can be studied from the table below.

	No. of LSAs	No. of Expiring Licenses	Spectrum Available for Auction (MHz)			Spectrum Available per LSA (MHz)			Spectrum Available per Licensee (MHz)		
			900	1800	Total	900	1800	Total	900	1800	Total
1. Feb'14 Auction	3	6	46.0	69.4	115.4	15.3	23.1	38.5	7.7	11.6	19.2
2. Proposed Auction											
A. 5 LSAs ≥ 14 Mhz of 900 Mhz Spectrum	5	10	71.6	12.6	84.2	14.3	2.5	16.8	7.2	1.3	8.4
B. 13 LSAs <14 Mhz of 900 MHz Spectrum											
B1. 7 LSAs <6.2 Mhz of 1800 MHz Spectrum	7	9	54.0	13.0	67.0	7.7	1.9	9.6	6.0	1.4	7.4
B2. 6 LSAs >6.2 Mhz of 1800 MHz Spectrum	6	10	58.4	73.2	131.6	9.7	12.2	21.9	5.8	7.3	13.2
Total for (2)	**18**	**29**	**184.0**	**98.8**	**282.8**	**10.2**	**5.5**	**15.7**	**6.3**	**3.4**	**9.8**

As explained earlier 2 conditions need to be fulfilled at each LSA level for a proposed auction to be feasible for the spectrum available with incumbent licensees (firstly a minimum of 14 MHz of 900 MHz spectrum should be available in the LSA and second a minimum of 17.4 MHz of total spectrum should be available inclusive of 1800 MHz). This condition was satisfied for all the 3 metro circles for which auctions were conducted in Feb'14. However, in the proposed auction for non-metro circles, the following are the issues –

(i) There is limited availability of 900 MHz for any new entrant to come in. Hence other than the 5 circles (AP, Gujarat, Karnataka, Maharashtra and Punjab), a new entrant can come in only at the cost of an existing licensee losing spectrum and closing operations.

(ii) There is a constrained availability of 1800 MHz spectrum to substitute the quantum of 900 MHz being reduced. Hence, in many circles the overall spectrum is inadequate to be able to reduce the current holding of 900 MHz so as to be able to create a new slot of 5 MHz to be deployed for 3G, if at all.

As against availability of 11.6 MHz spectrum per licensee in 1800 MHz band in Feb'14 auctions**, in the 5 circles (AP, Gujarat, Karnataka, Maharashtra and Punjab)where at least 14 MHz is available in 900 MHz band**, only 1.3 MHz per licensee is available per licensee in the 1800 MHz band in the proposed auction (including unsold spectrum with DoT). Hence if the block size of 900 MHz is reduced to 4.5 MHz for an incumbent licensee, then the total availability of spectrum for them in the auction will be only 5.8 MHz (4.5of 900 + 1.3 of 1800), which is much lower than their current holding of 7.3MHzper license (6.2 MHz to 10 MHz for individual licenses) which supports their current traffic. This reduction of overall spectrum will seriously impact the quality of service of incumbent licensees,

even if they were able to win all the 1800 MHz available for auction. In the remaining 13 circles, there is not adequate 900 MHz spectrum available for the base spectrum so the availability of 1800 MHz is irrelevant.

(iii) There is no availability of fall back spectrum in 1800 MHz band for any incumbent licensee who fails to win 900 MHz spectrum in the auction. The consultation paper has recognised this fact in para 2.3 at page 8 as under –

"…The auction poses a very real problem for incumbent licensees i.e. the very continuity of their service in an LSA is subject to the outcome of the auction. The situation becomes more serious considering the fact that in most LSAs, there is not much spectrum available in the 1800 MHz band either. As can be seen from Table 2.4, only in 7 LSAs, the quantum of spectrum that can be put up for auction in the 1800 MHz band is 5 MHz or more. Therefore, the incumbent TSPs will have no alternative but to try and win back spectrum in the 900 MHz band."

In Feb'14 auctions in the 3 metros, **11.6 MHz of 1800 MHz spectrum per licensee was available in the 1800 MHz band**. Hence, in the event of the existing licensefailing to win the 900 MHz spectrum, they had adequate fall back spectrum available in 1800 MHz to ensure continuity of their operations (It may be clarified that while this fall back was available, this is not desirable, because replacing a 900 MHz network with an 1800 MHz network will result in a colossal waste of equipment, money and time as captured in the Analysys Mason report attached at Annexure D. Even though the investment is in private domain, Telecom Operator investments are National Assets and pride of the nation. Every effort should be made to prevent its destruction impacting customers, employees, bankers and investors, etc.)

As against the situation in Feb'14 auction,in the proposed auction:

- There is no backup spectrum in 5 LSAs with ≥ 14 MHz 900 MHz spectrum (AP, Gujarat, Karnataka, Maharashtra and Punjab) where on an average only 2.5 MHz of total 1800 MHz is available per LSA (maximum being 4 MHz in AP).

- In the next category out of the 13 LSAs with < 14 MHz spectrum in 900 MHz band, there is no backup 1800 MHz spectrum in 7 circles (Assam, Bihar, Kerala, Madhya Pradesh, UP East, UP West and West Bengal) where on an average only 1.9 MHz of total 1800 MHz is available per LSA (maximum being 4 MHz in Kerala).

- In the balance 6 circles (Haryana, Himachal Pradesh, North East, Orissa, Rajasthan and Tamil Nadu) there is an average of 12.2 MHz of 1800 MHz spectrum available.

Hence in the event of inability to win 900 MHz by any of the existing licensees in the 12 LSAs in the first two categories (A and B1) where maximum availability of 1800 MHz in any single LSA is 4 MHz (in AP) which is not adequate for providing GSM services, closure of operations in the specific LSA is inevitable.

Based on the above we reiterate our view stated at the end of section A that the expiring licenses should be extended on mutually agreed terms as per the license agreement, 2100 MHz spectrum should be auctioned for 3G and the proposed auction should be dropped till adequate spectrum is available.

2. <u>1800 MHz spectrum won in Feb'14 auctions</u>

The consultation paper at page 8 states "*that some of these TSPs have acquired spectrum in some LSAs in the 1800 MHz band in the November 2012/February 2014 auctions, as discussed later in this Chapter. Therefore, they will have some backup arrangement, though not a very preferable one, if they fail to get back spectrum in the 900 MHz band*."

At the outset let us clarify that while this is theoretically possible, but in practice this will result in closure of operations for a fairly long period of time while shifting is done from 900 MHz spectrum to 1800 MHz spectrum impacting a very large number of subscribers who will then be forced to port to other service providers. Hence the existing licensee due for extension will lose its entire subscriber base and will have to start afresh as a new operator. Besides this, there will be significant wastage of equipment and huge additional cost involved in doing so. M/s Analysys Mason had published a paper on the subject of refarming (under a scenario where 900 MHz spectrum is not available for GSM services and is instead substituted by 1800 MHz) in June, 2012 which is attached herewith as Annexure D. The salient conclusions of the said report are as under –

a) Operators with 900MHz band will **need to replace 286,590 existing base stations** and install an **additional 171,954 base stations over and above the 286,590 replacements** to provide equivalent coverage on 1800MHz frequency.
b) The replacement of 900MHz base stations and deployment of additional sites on 1800MHz will result in an **incremental capex of INR 54,739 crores**, and **incremental annual opex of INR 11,762 crores**.
c) There is a **risk of reduction of existing geographic coverage by as much as 40%** and loss of connectivity for 70 million subscribers, in case operators do not match coverage due to business case viability and operational feasibility
d) The overall **process of migration from 900MHz to 1800MHz may take up to three years for completion**, during which the quality of service will be severely hit
e) The business case for a new operator acquiring 900MHz spectrum at the proposed prices **will not allow for expansion to rural markets** to address these coverage gaps
f) If the incremental investment in refarming and the costs of spectrum are passed on to consumers in the form of enhanced retail voice tariffs, **the overall tariffs will go up by as much as 61 paise per minute**, with a higher impact on tariffs in non-Metro circles
g) If the cost of refarming is not passed on to consumers, then the EBITDA margins of operators with 900MHz spectrum holdings will decline by about 8%.
h) The installation of additional sites will **increase diesel consumption and contribute to environmental pollution equivalent to that of an additional 4.5 million cars.**

However, even if one were to consider this as a possibility despite the impracticality, there are many circles where the 1800 MHz spectrum is not available for the full circle. In Idea's specific case, there is <u>no fall back spectrum available in 1800 MHz band</u> if we fail to win 900 MHz spectrum in the auction in the following 6 circles out of 9.

Circle	Status of 1800 MHz spectrum won in Feb'14 auctions **(in all cases wherever we have referred to 5 MHz spectrum slots, these are intended to be used for LTE and deploying the same for GSM is not desirable).**
Gujarat	Idea won only 1.6 MHz spectrum
Haryana	Idea won 5MHz spectrum, which is not available in Sirsa district and is not adequate for handling the traffic as our current spectrum is 6.2 MHz in 900 MHz band
Karnataka	Idea won 5 MHz which is not adequate as our current spectrum is 6.2 MHz in 900 MHz band.
Maharashtra	Idea has only 4 MHz of spectrum which is available throughout the circle. The 5 MHz block is not available in the main districts of Pune and Nasik.
Punjab	Idea won only 3MHz which is available across the circle. The 5 MHz block is not available in the main districts of Amritsar and Ludhiana.
UP (West)	Idea did not win any 1800 MHz spectrum

The availability of partial spectrum would affect continuity of services not only in the specific districts, but also adjoining areas and districts resulting in a cascading effect on existing/ regular subscribers which will lead to a mass exodus even in other locations where there is fall back option; A 'Black out' is an imminent and real possibility in above areas. . The effect is diametrically opposite to the policy of the Government which is 'to connect the unconnected'. The Authority needs to consider the impact of such partial allocation on continuation of services without massive disruption and quality degradation.

C. Government Policy and adverse impact of proposed auction vis a vis policy objectives

1.Telecom Policy Framework and Objectives

1. It is significant to note the primary objective of NTP-2012 is maximizing public good by making available affordable, reliable and secure telecommunication and broadband services across the entire country. If the existing 29 licensees (whose license is due for extension in 18 service areas) who serve more than 280 million VLR subscribers (TRAI VLR Report June 2014)and provide services in deep rural pockets are under threat of closure/ discontinuity of operations, then it would be ANTI the stated Government policy.

2. In this regard, the Authority would note that the **NTP 2012 mentions the following** :

   MISSION

a. *To develop a robust and secure state-of-the-art telecommunication network providing seamless coverage with special focus on rural and remote areas for bridging the digital divide and thereby facilitate socio-economic development.*

b. *To create an inclusive knowledge society through proliferation of affordable and high quality broadband services across the nation.*

OBJECTIVES

a. *Provide secure, affordable and high quality telecommunication services to all citizens.*
b. *Increase rural teledensity from the current level of around 39 to 70 by the year 2017 and 100 by the year 2020*
c. *Provide affordable and reliable broadband-on-demand by the year 2015 and to achieve 175 million broadband connections by the year 2017 and 600 million by the year 2020 at minimum 2 Mbps download speed and making available higher speeds of at least 100 Mbps on demand.*
d. *Provide high speed and high quality broadband access to all village panchayats through a combination of technologies by the year 2014 and progressively to all villages and habitations by 2020.*

STRATEGIES. BROADBAND, RURAL TELEPHONY AND UNIVERSAL SERVICE OBLIGATION FUND (USOF)

1.1. To develop an eco-system for broadband
1.2. …
1.3. To lay special emphasis on providing reliable and affordable broadband access to rural and remote areas ….
1.4. Provide appropriate incentives for rural rollout.

3. Thus it is clear that the Government visualizes and promotes growth of services in rural areas as well focuses on growth of broadband. For achieving these twin objectives, spectrum is the key raw material.

4. The NTP 2012 approach is not "either "/ "or" – both rural coverage and broadband growth are required. Thus it is essential that the Regulator upholds these objectives address these issues before proposing an auction.

5. The Authority would also acknowledge India has over 790 Million VLR Subscribers with only 8% penetration of 3G and new subscriber addition growing at 65 to 70 Million subscribers per year mainly in GSM services.

   a. While urban penetration is ~140%, rural penetration is ~44%.

   b. **At least another 400 to 500 Million Rural and low income urban consumers are yet to be connected. Due to diverse nature of the country with huge unconnected population at bottom of the pyramid, the NTP 2012 objective was thus aimed at supporting more investments in 2G for expansion of Services in deep rural pockets. The Authority would acknowledge that the mature 2G Technology with well-developed equipment and device business, is the key vehicle for growth.**

   c. The existing licensee whose license is due for extension, has in last 20 years developed deep experience in Rural and hinterland market is the best bet than a new player acquiring spectrum , sinking fresh investments and then developing the resources to reach to deep rural pockets, which can take upto 3-5 years.

   d. Any proposal for Auction should thus ensure not only continuity of existing Services but encourage increased investment from the existing licensees.

2. Impact where Incumbent licensees fail to win current holding of 900 MHz spectrum used for GSM

As discussed earlier if it is not the intention of the government that 900 MHz spectrum be shifted from its current use for GSM to broadband, then this auction is not required at all. If it is the intention of the government to release some of 900 MHz spectrum from GSM for 3G, then a minimal 900 MHz spectrum needs to be available to the existing licensees due for extension for ensuring continuity of their existing operations built over the last 20 years. If this is not ensured then this will have serious adverse consequences as detailed below –

a. Disruption of Telecom Services

Currently India has 715 mn VLR subscribers (Jun'14) in the 19 non-metro circles. Out of these 387 mn VLR subscribers **(54%)** depend on GSM services provided by the 41 incumbent licensees holding 900 MHz spectrum whose licenses are expiring in Dec'15 or in the next few years. If we look at the 29 licensees whose licenses are due for extension in in Dec'15 and early 2016, these account for 280 mn out of these 387 mn VLR subscribers. By any account this is a large number of subscribers and any win of spectrum by a new entrant, which can only be at the cost of an existing licensee due for extension losing its spectrum and closing operations (unless more 900 MHz spectrum is made available) will result in serious disruption of services to the existing relevant subscribers. The magnitude of disruption will be huge.

b. Significant shrinking of rural coverage

In many rural areas, it is only the incumbent licensees who have a network and hence the closure of operations will leave the subscribers with no other alternative, but to be left helpless without telecom services. Nothing can be more detrimental to the cause of government policy of increasing rural coverage and reach of telephony to far corners of the country.

The government is also trying to promote mobile banking as a vehicle of financial inclusion. The Honourable Prime Minister has already stated his vision of ensuring that every household in India should have a bank account. This vision will have a great setback if a large chunk of rural area would be left without mobile network coverage. We have tried to do an analysis of the extent of shrinking in coverage if the networks of 900 MHz private operators were not available and the analysis of 4 circles (~90% accurate) are as under –

LSA (Circle)	Towns and Villages (nos.)			
	Total in LSA	Covered by 900 MHz private operators	Covered by other operators	Loss of coverage without 900 MHz licensees due for extension
Maharashtra	41,747	32,905	16,230	16,675
UP West	39,748	36,654	25,181	11,473
Andhra Pradesh	28,913	21,455	9,855	11,600
Gujarat	18,674	15,061	6,829	8,232
Total	**1,29,082**	**1,06,075**	**58,095**	**47,980**

As can be seen from this sample, almost 45% (47,980 out of currently covered 106,075towns and villages) stand to lose coverage if the 900 GSM networks of existing private operators were unable to continue

services. Also as can be see there is still significant number of towns and villages which need to be covered i.e. 23,007 (129,082 – 106,075) or about 18% and the objective of ensuring this coverage would never be achieved if the existing 900 MHz GSM networks were to discontinue their services or forced to pay spectrum amounts far beyond its intrinsic valuation due to predatory competition or otherwise.

c. Disruption of services in Urban Areas – MNP is not the answer

Even in areas where other existing operators provide coverage, the fact that 54% of subscribers depend on the networks of incumbent licensees and such a large number of subscribers cannot be accommodated by these other networks. This is firstly not possible from a network capacity perspective. More importantly the MNP systems are not designed to handle this magnitude of transfers.

If any bulk porting takes place in future which is not foreseen, then there will be a huge impact at the operators end and there would be major challenges on Dimensioning Uncertainty, Complete Architecture Change, Signalling traffic Migration across Pan India for MNP Dipping, Threat of existing MNP getting impacted and Network Readiness of Other Operators. Besides there would be host of service delivery and IT related issues. The same is captured as per Annexure H.

d. Auction of existing spectrum would lead to wastage of Telecom Assets

The life of the license was to mirror the life of the business, an elementary feature of any infrastructure investment. This was the Business Continuity Promise based upon which telecom companies made huge investments. Due to the proposed auction, the existing 900 MHz network of the Idea and other similarly placed operators may be left stranded leading to wastage of existing investments. Wasteful capital expenditure or a costly duplicate network will have to be rolled out by new operators who will have to set up an infrastructure/build coverage using an alternate spectrum (almost certainly requiring additional base stations).

Analysys Mason Report "(Annexure D) states the replacement of 900MHz base stations and deployment of additional sites on 1800MHz will result in an **incremental capex of INR 54,739 crores**, and **incremental annual opex of INR 11,762 crores**." From a national perspective, the additional cost will be more than the government revenue and hence the net impact for the country will be hugely negative.

IT IS WORTHWHILE TO MENTION THAT THERE IS NO SINGLE PRECENDENT IN ANY OTHER COUNTRY WHERE SPECTRUM CURRENTLY IN USE BY AN INCUMBENT LICENSEE WHICH IS MOST EFFICIENTLY UTILISED AND ON WHICH MORE THAN 50% OF THE SUBSCRIBERS DEPEND IS PUT TO AUCTION IN A MANNER WHERE THE INCUMBENT LICENSEE CAN POTENTIALLY LOSE THE SPECTRUM TO SOMENEW ENTRANT.

3. Predatory Competition resulting from auction with inadequate spectrum

If the proposed auction is proceeded without creating an extra block of 900 MHz spectrum over and above the 4.5 MHz minimum requirement for each existing licensee due for extension, besides the risk of incumbent losing spectrum and closing services, the competition in the auction is between the following group of bidders –

a. The incumbent licensees who need to necessarily get the spectrum or face closure of business BUILT over the last 20 years; and

b. Prospective new entrants who being aware of the precarious position of the incumbent licensees can put in irrational bids not reflecting the inherent value of the spectrum, knowing that the incumbent licensee will be forced to match the bid.

Three existing licensees due for extension licensees have already submitted a letter dated August 5, 2014 to the Authority which deals with the subject in greater detail and is attached herewith as Annexure E.

D. Auction not in line with License Agreement and government policy and pronouncements

1. Proposed auction violates existing Government commitments made under National Telecom Policy 1999

a. The right of extension flows from the terms of the license and with the mandate of National Telecom Policy – 1999 (NTP-99) which was the regime in which the license was granted. The NTP-99 under Clause 3.1.1 (para 3), asserted:

"Availability of adequate spectrum is essential for providing optimal bandwidth to every Operator ..."

b. Further, NTP-99 *inter-alia* stipulated that a cellular mobile service provider would be granted separate license for each service area for an initial period of 20 years, which will be further extendible by additional period of 10 years at a time. The focus of the policy was on the tenure of the license which is evident from the following under clause 3.1.2 (Para 2) :

"*Licenses would be awarded for an i**nitial period of twenty years** and would be extendible by **additional periods of ten years thereafter."***

2. Violates License Terms

a. Idea Cellular Limited (Idea) has valuable and enforceable contractual right under the license for grant of an extension along with the underlying spectrum. The objective of the Government policy/ NTP-99 was incorporated into our license and is embedded in clauses (iii) of License amendment dated 29.01.2001 (for CMTS licenses) / License agreement Clause 4.1 (for UAS licenses migrated from CMTS) which reads as under:

*"(iii) Period of license: The period of license shall be twenty years from the effective date of the existing license agreement unless terminated for the reasons stated therein. T**he Licensor may extend the period of license, if requested during 19th year from the effective date for a period of 10 years at a time on mutually agreed terms and conditions.** The decision of the licensor shall be final in regard to the grant of extension."*

b. The license explicitly suggests extensions of '10 years at a time' on 'mutually agreed terms' i.e. it contemplates multiple extensions. Each Extension Period was to be on mutually agreed terms.

c. Vide letters of 21.01.2013 and 13.01.2014, Idea submitted its application for extension of licenses. This has still not been decided by DoT, though as Licensor, DoT has an obligation under the license to

honor the contractual commitment. However by choosing not to respond to Idea, DoT has effectively deprived Idea of its valuable right of spectrum for next 20 years and continuity.

3. <u>Proposed auction is contrary to the Government's Press Release of February 2012.</u>

a. The Authority has recognized and recorded in the present Consultation Paper (refer point number 1.2 of Chapter 1) that the *DoT vide its Press Statements dated 15th February 2012 announced an important policy decision which inter-alia declared that the validity of existing UAS & CMTS and Basic services licences may be extended for another 10 years at one time, as per the provisions of the extant licensing regime with suitable terms and conditions so as not to imply automatic continuance of existing licences and related conditions including the quantum and price of any spectrum allocated.*

b. The said Press Release also further confirmed that *"on extension, the UAS licensee will be required to pay a fee which will be Rs. 2 crore for Metro and 'A' Circles, Rs. 1 crore for 'B' circles and Rs. 0.5 crore for 'C' circles. This fee does not cover the value of spectrum, which shall be paid for separately.* ***While extending the license, the licensee shall be assigned spectrum only up to the prescribed limit or the amount of spectrum assigned to it before the extension, whichever is less..."***

c. ***The prescribed limit on spectrum was also defined in the said Press Release to be 2X8MHz/ 2X5MHz for GSM/ CDMA technologies respectively for all service areas other than in Delhi and Mumbai where it was 2X10MHz/ 2X6.25 MHz.***

d. We submit that the Government ought to honor its own decision and the licenses should be extended along with spectrum at least upto the prescribed limit. **The terms and conditions of such extension, including the price for spectrum upto the prescribed limit, may be recommended by the Authority as a part of this consultation.**

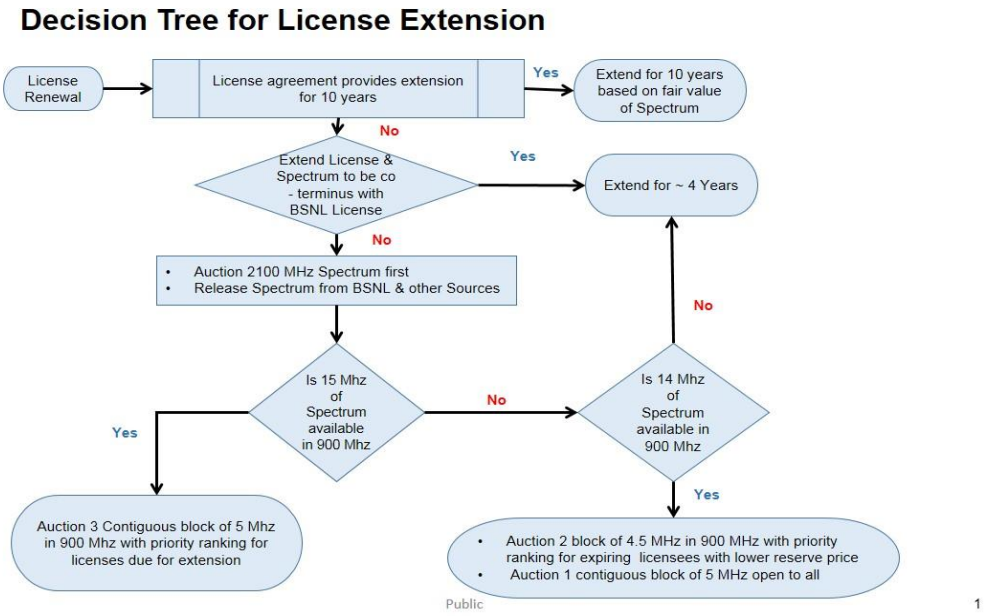
We submit that only spectrum beyond the above prescribed limit should be put up for auction in the open market. We further submit that any auction should be conducted only once adequate spectrum is available.

The proposed auction for licenses expiring in 2015-16, violates the Government commitment made in NTP 1999, existing licensing conditions and even the Government's own press release of February 2012.

In view of the above Government needs to implement its own decision and the policy, contractual rights of Idea and other similarly placed licensees have to be decided forthwith and in any event prior to the next spectrum auction.

E. Our Proposals to address the issues

Based on detailed submissions given earlier, we submit that the decision for extension of Licences ought to be as follows :



The above is explained in detail below :

1. Auction 2100 MHz first

900 MHz band spectrum is the first spectrum that was allocated for GSM. The incumbent GSM operators rolled out their networks in this band. In the 19 circles (non-metros with 41 licensees being 2 licensees in all LSAs except Assam, NESA and West Bengal with 3 licensees), 387 Mn (Reference TRAI VLR Report June 2014) or 54 % of all VLR subscribers depend on network of incumbent operators whose GSM network is primarily on 900 MHz(only private operators excluding BSNL) and whose licenses are expiring in the next few years. Out of the 41 licenses, 29 are expiring in Dec'15 or early 2016 and these account for 280 Mn VLR subscribers out of the total 387 Mn subscribers for 41 licenses.

Now 900 MHz band can be used for both GSM and 3G. 2100 MHz band is the other band which can be used for 3G services. In the 2010 auction in view of limited availability of 2100 MHz band for 3G services, no single private operator could get 3G spectrum on a pan India basis. Given that there is uncertainty of availability of more 2100 MHz spectrum, it is natural for operators who do not have 3G spectrum in a circle to try and get 900 MHz spectrum for 3G services. However, since limited quantity of 900 MHz is available, diversion of 900 MHz from GSM to 3G usage will inevitably result in disruption of GSM services on which 54% of subscribers depend for mobility services.

In light of the above it is essential that first of all the 2100 MHz available with DoT (including that which can be released from Ministry of Defence) should first be made available and put up for Auction. This will enable operators to complete their 3G footprint without trying to get 900 MHz spectrum for 3G, which can only be at the cost of disruption of GSM (2G) services, as explained above.

2. Solution for 18 LSAs with 29 expiring licenses – extension or auction with some prerequisites

Having first accomplished auction of 2100 MHz, the next step should be to address extension of expiring licenses. We are listing down the options in this regard in order of priority –

a. As already elaborated elsewhere the license agreement provides for extension of license for 10 years at a time based on mutually agreed terms. Hence, the best way is to extend the license based on market discovered price of spectrum for 1800 MHz and applying a multiple of 1.5x for 900 MHz. Some adjustments will have to be made for extreme cases where the 1800 MHz prices were extremely high due to very low availability of spectrum. We have already confirmed to DoT through letters Idea's willingness to pay for value of spectrum based on fair value derived from market prices.

   It may also be noted that all the licenses are not coming up for extension at the same time. In all the circles, the extension of licenses (for holders of 900 MHz spectrum) until 2025 is due as under –

Year	Private Operators	MTNL / BSNL
FY 16	29	-
FY 18	-	2
FY 19	1	-
FY 20	-	19
FY 24	7	-
FY 25	4	-
Total	41	21

Even if DoT does not want to extend the licenses for 10 years now, at the minimum licenses should be extended to Feb, 2020 (expiry year of BSNL licenses), so that the extension of all non-metro licenses can be done together and these can thereafter be co-terminus.

   It is difficult to understand as to how extension of licenses falling due beyond 2016 will be done. Are we going to have auctions every year for extension of as few as 1, 4or 7licenses? This seems neither logical nor practical. Also in future when licenses are not co-terminus, we would come up with awkward situations where only one license in a LSA falls due for extension and the existing licensee is being forced to win back that spectrum in an auction or face closure of business in that LSA. Hence, to set this right once and for all, all the non-metro licenses should be made co-terminus, so that future administration is easier and in a single group. There are international precedents of regulators in other countries extending the licenses issued at different times to make them co-terminus. Examples of Belgium, Malta, Netherlands and Switzerland are given in Annexure G.

b. The challenge being posed by the proposed auctions is the limited availability of 900 MHz spectrum. It may be noted that 900 MHz spectrum in most circles is with 2 private operators and a third slot is with BSNL. Even if licenses are not extended for 10 years, at the least these should be extended upto the time when BSNL licenses come up for renewal (i.e. upto FY20 which is ~4 years extension), so that

the availability and distribution of 900 MHz spectrum can be optimised. This can be understood better with the details explained in the next section.

c. While extension as explained above is the best way to deal with expiring licenses, if an auction were to be conducted for renewal following an auction of 2100 MHz for 3G as mentioned above, the following is suggested for conducting the auctions.

(i) At the outset we want to be clear that while 14 MHz is the absolute minimum spectrum required in 900 MHz band as explained below (9.5 MHz for LSAs with single expiring license), a 4.5 MHz slot will be a sub-optimal utilisation of 900 MHz spectrum. Ideally a minimum of 15 MHz (3 contiguous blocks of 5 MHz each, or 2 contiguous blocks of 5 MHz each in LSAs with single expiring license) is required for the best use of spectrum now and later when the spectrum may have to be deployed for new technologies. Our suggestions below reflect sub-optimal solutions based on current availability of spectrum with DoT. However, as suggested by TRAI in the consultation paper (para 2.5) and our suggestions in Part A, DoT should try and get more 900 MHz spectrum from BSNL, other non-telecom users and E-GSM spectrum to create more contiguous blocks of 5 MHz each.

Given that the availability of 1800 MHz is now limited and so 900 MHz will be the base spectrum for GSM services for incumbent licensees, the following are the minimum requirements for an auction to be conducted for renewal –

- At least 2 licenses in a LSA should be given extension together by auction.
- At least 14 MHz (9.5 MHz in circles with single expiring license) of 900 MHz band spectrum should be available in the given LSA (to provide for 2 blocks of 4.5 MHz required for GSM operations and a new block of 5 MHz which can be deployed for 3G technology).
- At least 17.4MHz of total spectrum (900 MHz and 1800 MHz) should be available in the LSA so that after carving out a 5 MHz block of 900 MHz, there is a total of 6.2MHz of total spectrum available for each of the 2 existing licensees due for extension, to ensure continuity of services to ~54% of subscribers in these LSAs.

If the above conditions are not met, then a new block of 900 MHz can only be won by a new operator at the cost of discontinuity of operations of an existing licensee due for extension.

Based on the criteria above only 5 circles (out of 18) would qualify for auction, which are as under

LSA (Circle)	Renewal Spectrum		Available with DoT	Total Spectrum (MHz)
	900	1800	1800	
Andhra Pradesh	14.0	4.0	-	18.0
Gujarat	14.0	2.0	-	16.0
Karnataka	14.0	2.2	0.8	17.0
Maharashtra	14.0	2.0	-	16.0
Punjab	15.6	1.6	-	17.2

In each of these circles the best case would be to release 1 MHz of 900 MHz band spectrum from BSNL and create 3 contiguous blocks of 5 MHz each.

(ii) **<u>There are further 5 circles (out of 18) with spectrum as under</u> –**

LSA (Circle)	Renewal Spectrum		Available with DoT	With BSNL		Total Spectrum (MHz)		
	900	1800	1800	900	1800	900	1800	Total
Haryana	12.4	-	8.0	6.2	3.8	18.6	11.8	30.4
Himachal Pradesh	12.4	-	10.2	6.2	3.8	18.6	14.0	32.6
Kerala	12.4	1.8	1.0	6.2	3.8	18.6	6.6	25.2
Madhya Pradesh	12.4	1.8	-	6.2	3.8	18.6	5.6	24.2
Rajasthan	12.4	2.0	0.4	6.2	1.8	18.6	4.2	22.8

In these circles, it is not possible to create three blocks of 900 MHz out of 12.4 MHz currently available. Going by the rationale explained in point (i) above, the following are the options –

aa. **The spectrum of existing licensees due for extension, is extended till the time BSNL spectrum comes up for renewal at which time more 900 MHz spectrum will become available.** In that case out of 18.6 MHz, the 3 GSM operators (including BSNL) can get 13.5MHz (3 x 4.5 MHz), which along-with available 1800 MHz can ensure continuity of GSM operations. This will provide additional 5.1MHz of 900 MHz spectrum, which can be deployed for 3G; **OR**

bb. In case the extension <u>is not feasible</u> and auction is to be conducted now, then the only way to prevent discontinuity of GSM operations of the incumbent operators would be by asking BSNL to release 1.6 MHz of 900 MHz spectrum to be made available in the current auction. This will still leave sufficient spectrum of 8.4 MHz (4.6 MHz of 900 MHz and 3.8 MHz of 1800 MHz) in 4 circles and 6.2MHz in Rajasthan to service their existing subscribers (which is still much higher than the minimum 6 MHz GSM spectrum proposed for the incumbent private operators who have much higher number of subscribers than BSNL).

(iii) In the remaining 8 circles (out of 18), currently spectrum ranging from 4.4 MHz (1), 6.2 MHz (6) and 8.8 MHz (1) spectrum is available. This is because in all these circles (except NESA with 8.8 MHz), only one license is due for extension. Such an auction if forced upon the existing licenses due for extension would be most unfair as that operator would be forced to bid any amount for continuity of its business or else face closure of business in that LSA. This is definitely NOT the intention of TRAI / DoT and this cannot be a mechanism for fair price discovery. Hence, the only way to solve the extension for these circles is to renew these only when the second private license is coming up for extension or along with renewal of BSNL license, whichever is earlier based on the principles mentioned in para (i) above.

d. A hybrid of above options could be to reserve 4.5MHz of 900 MHz band spectrum for each expiring license and auction the rest. The price determined in the auction for the remaining spectrum can be used as the fair value for the purpose of extension. In such a scenario, it must be appreciated that in the last auction wherever sufficient spectrum was available (>= 15 MHz in 10 circles), the winning price was equal to reserve price. This clearly indicates that the reserve price was actually high and the fair value was actually below the reserve price. In light of this if any auction is conducted, it is necessary that the reserve price is discounted by more (say 40%) than 20% (which was used last time) from the fair value of spectrum, so that a true market price discovery can happen. In any case the reserve price should not exceed those recommended by TRAI in Sep, 2013.

3. <u>Specific auction rules needed to implement above suggestions</u>

The above suggestions have been made to ensure the continuity of operations for the incumbent licensees. However, for this objective to be achieved, **<u>certain specific points will also have to be incorporated in the auction design / rules. These are listed below -</u>**

- **For 900 MHz the block size should be 5 MHz where sufficient spectrum is available for all incumbent licensees (one or two as applicable) plus one new block of 5 MHz to be created. In case this is not possible, then block size should be reduced to 4.5 MHz,** in which case the same cannot be deployed for new technologies. Incremental quantities should be allowed to be bid in multiples of 0.1 MHz (this was 1 MHz in the Feb'14 auction) given that the quantity of spectrum available is not in multiple of 1 MHz and is different in different circles. For the sake of clarity we want to reiterate that auction should not be conducted in circles with less than 14 MHz of 900 MHz band spectrum (9.5 MHz in case of single expiring license).

- There is a need to ensure that the existing licensees due for extension are given at least 4.5/5MHz if they are bidding for a block at a given price. In the Feb'14 auction, the provisional winners out of those who had bid at a given price were decided by a set of ranking rules whereby a bidder for a higher quantum could have got all the spectrum that it had bid for because of higher ranking and the lower ranked operator could be left without any spectrum. In this particular auction, the rules will have to be modified in a manner that –
  a. Based on the minimum block size of 4.5 / 5 MHz, the first allocation should be made for 4.5/5 MHz to each existing licensee due for extension /bidder at a given price before any provisional winning allocation is made to a new entrant (anyone other than an incumbent licensee of 900 MHz spectrum) i.e. an existing licensee due for extension who had put a bid for a minimum block size should be ranked higher than a new entrant.

     For example, if there is 14MHz available in 900MHz and there are three bidders with bids of 4.5, 5 and 10 MHz, all should be declared provisional winners for 4.5MHz with existing licensees due for extension ranking above any other bidder; and then, the balance 0.5MHz should be allocated as per ranking. Further, if there are two bidders with bids of 4.5MHz and 10MHz, then both should be first allotted 4.5 each with ranking of existing licensees due for extension being higher than any other bidder and then balance should be allocated as per ranking.

  b. **In case of 1800MHz, the authority should distinguish between existing licensees (licensees whose licenses are due for extension in 2015 and 2016) and a new entrant in a given LSA. Any**

new entrant bidding for 1800 MHz should be allowed to bid only for minimum quantum of 5 MHz and for any existing licensee the minimum bid size should remain at 0.2 MHz.

c. The existing licensees should be allowed to bid for 1800 MHz under 3 categories (2 options). These options would be chosen at the time of putting each bid in the auction and the allocation of spectrum against bids would need to be based on the choice made. The categories and the rationale for the options are explained below –

(i) Allocation of 1800 MHz to be made only if allocation of 900 MHz is being made for a minimum block of 4.5 MHz. In this case allocation of 1800 MHz should be made only concurrently with 900 MHz and if the allocation of 900 MHz is < 4.5 MHz, then NO 1800 MHz should be allotted.
Rationale: This is relevant because an existing licensee would most likely be bidding for 1800 MHz to get 6.2 MHz or more of total spectrum (i.e. bidding for 1.7 MHz or more of 1800 MHz spectrum). In case such an existing licensee is allocated only 1800 MHz spectrum and no 900 MHz spectrum, it will not be able to use the 1800 MHz spectrum at all and it will be a waste of spectrum for him and also a waste of national resource.

(ii) Only full allocation of 1800 MHz to be made and if the full allocation cannot be made based on availability and ranking then NO allocations of 1800 MHz spectrum should be made.
Rationale: This is relevant because an existing licensee would select this option where it wants this as a fall back spectrum (including a scenario where the existing licensee takes this as a top up spectrum to the 1800 MHz already available with it) in the event it is unable to bid further for 900 MHz spectrum. In such a case if it does not get the full bid quantity, it will not be able to use the 1800 MHz spectrum at all and it will be a waste of spectrum for him and also a waste of national resource. For example, if an existing licensee has got 2 MHz of 1800 MHz spectrum and bids another 2.4 MHz to get to 4.4 MHz of total 1800 MHz spectrum, then it will not want an allocation of less than 2.4 MHz, because it will not be able to use less than 4.4 MHz of total spectrum for any purpose.

(iii) The last is a default category whereby normal rules of auction will apply.

In general the auction design should be such that the 900 MHz spectrum is first secured for existing licensees whose licenses are due for extension to avoid discontinuation of their operations, maximum spectrum is made available in contiguous blocks and frequency allocation rules are transparently announced to the bidders before the auction.

4. Urgent Need for Harmonisation of Spectrum and Provision of spectrum across full LSA

As has been brought out in the Consultation Paper, the spectrum allocation to the Operators at present is in a very fragmented manner, because of which operators cannot enjoy spectral efficiency that contiguous spectrum provides. Also contiguous spectrum is essential for launching new technologies like 3G and 4G. Another advantage of harmonisation would be that some additional contiguous blocks could be created and auctioned.

Moreover, BTS equipment supplied by vendors have an Instantaneous Bandwidth (IBW) of 35MHz in the 1800 MHz band. Thus operators are not able to use the spectrum allocated to them when it is spread over more than 35MHz by use of a single BTS. They perforce have to deploy two BTS to use the total spectrum allocated to them. Case in example is the Spectrum allocated to Idea Cellular in Delhi where the two blocks of 1800 MHz spectrum allocated to them have a separation of over 62 MHZ.

We therefore feel that there is an urgent requirement to carry out harmonisation so as to get maximum contiguous spectrum for launch of new technologies. For this we feel following actions need to be taken upon Priority.

a. Declaration of the Defence Band for 1800 MHz as planned.

b. Based on this, readjustment and harmonisation of spectrum. This should include both the administratively allocated spectrum and the spectrum won in auction. It may be noted that the use of the administratively allocated spectrum for new technology would still be governed by the DoT.

c. COAI has already made detailed suggestions LSA wise for the harmonisation of spectrum for all Operators to the DoT even before the Feb 14 auctions. We strongly recommend that this be done before the proposed renewal auctions, as it would result in some additional contiguous spots in 1800 MHz being available for the next auction.

d. Another benefit of creating the Defence Band would be that all the partial spectrum allocations in the Feb14 auction and even the administered spectrum, would get regularised and available across the LSA.

A similar activity needs to be carried out in case of 900 MHz, where we find some 200 KHz gaps in the allocation of spectrum to BSNL. If these users are shifted to one end of the 900 MHz spectrum then an additional contiguous spectrum in 900 MHz would be possible.

Without prejudice to our detailed submissions as above, we now proceed (starting at page no. 26 onwards) to respond to specific Queries raised by the Authority :

Questions from Present Consultation Paper

OVERVIEW ON SPECTRUM AVAILABILITY IN DIFFERENT LSAs (Q.1 TO Q.5)

Before we provide our responses and analysis for specific questions, we are giving an overview of significant points on this subject as under -

1. DoT's letter dated April 17, 2014, has asked TRAI to recommend reserve price for auction of 900 MHz and 1800 MHz in light of some the licenses expiring during December, 2015 to early 2016. As has been stated in our introductory comments, an auction is not required for extension of licenses as per the terms of License Agreement which provide for extension on mutually agreed terms.

2. **Without prejudice to the above, it is submitted that the proposed Auction is different from the Feb'14 auctions since**

   a. **If the minimum block size is 5 MHz for 900 MHz band, then there is no possibility of creating an extra block of 900 MHz spectrum for a new entrant other than the one or two blocks required for the existing licensees. Hence, a new entrant can get 900 MHz spectrum only at the cost of discontinuation of services of an existing licensee and the consequent disruption of services to a large number of subscribers. At best in 5 circles where 14 MHz of spectrum is available, a new block of 5 MHz can be created while reserving 9 MHz for existing licensees.**

   b. **T**here is a constrained availability of 1800 MHz spectrum to substitute the quantum of 900 MHz being reduced. ***Even the 1800 MHz spectrum won in Feb'14 auction,*** is not available for the full circle.

3. **The proposed auction is ANTI the stated Government Policy and would have an adverse impact on Telecom Policy Framework and Objectives.**

4. **The Authority needs to understand the impact where Incumbent licensees fail to win current holding of 900 MHz spectrum used for GSM. Such a situation could lead to :**
   - Disruption of Telecom Services
   - Significant shrinking of rural coverage
   - Disruption of services in Urban Areas – MNP is not the answer

- Auction of existing spectrum would lead to wastage of Telecom Assets
- **Predatory Competition resulting from auction with inadequate spectrum.**

5. **Further, the proposed auction not in line with License Agreement and government policy and pronouncements. Specifically :**
   - **Proposed auction violates existing Government commitments made under National Telecom Policy 1999**
   - **Violates License Terms**
   - **Proposed auction is contrary to the Government's Press Release of February 2012.**

6. **The proposed auction will thus not serve any of the objectives specified for the earlier auctions and in the event of any existing licensee failing to win the spectrum for continuing its services on the network built over last 20 years, it will work against the objectives of efficient use of spectrum, promotion of competition and rollout of services.**

7. **In view of the above, we submit that there is absolutely NO NEED FOR CONDUCTING AUCTIONS for the purpose of extending expiring licenses. Licenses can be extended based on mutually agreed terms as per provisions of the License Agreement.**

8. **In a worst case scenario, if auctions are proceeded with the quantity put up for auction and the auction design should be such that ALLOCATION OF AT LEAST 4.5 MHZ OF 900 MHZ SPECTRUM IS ENSURED TO EACH OF THE 29 LICENSEES WHICH ARE DUE FOR EXTENSION IN DEC 2015 AND 2016 AND WHOSE CURRENTLY HELD SPECTRUM IS PROPOSED TO BE PUT UP FOR AUCTION, SO THAT THEY ARE NOT FORCED TO CLOSE THEIR OPERATIONS BUILT OVER LAST 20 YEARS.**

Q.1. Please comment on the issue of making available additional spectrum in contiguous form (as discussed in para 2.5 and 2.13) in the 900 MHz and 1800 MHz band.

1. In para 2.5 at page 9 of consultation paper the authority has rightly recognized the constraint of spectrum availability while stating that "the Authority is of the view that before conducting the auction the Government should explore the possibility of making available one additional block of 5 MHz contiguous spectrum in the 900 MHz.

2. Before we address the issue on additional 900 MHz, we would like the Authority to appreciate the need for **firstly auctioning 2100 MHz.**

- 900 MHz band spectrum is the first spectrum that was allocated for GSM. The incumbent GSM operators rolled out their networks in this band. In the 19 service areas, 387 Mn or 54 % of all VLR subscribers (TRAI VLR Report June 2014) depend on network of incumbent operators whose GSM network is primarily on 900 MHz .
- The 900 MHz band can be used for both GSM and 3G.
- In the 2010 auction in view of limited availability of 2100 MHz band for 3G services, no single private operator could get 3G spectrum on a pan India basis. Given that there is uncertainty of availability of more 2100 MHz spectrum, it is natural for operators who do not have 3G spectrum in a circle to try and get 900 MHz spectrum for 3G services.
- However, since limited quantity of 900 MHz is available, diversion of 900 MHz from GSM to 3G usage will inevitably result in closure / disruption of GSM services on which 54% of subscribers depend for mobility services.
- In light of the above it is essential that the auctions of 2100 MHz be held either prior or atleast concurrent to 900 MHz auction. This will enable operators to complete their 3G footprint without trying to get 900 MHz spectrum for 3G, which can only be at the cost of disruption of GSM (2G) services, as explained above.

3. **Despite our submissions on "no need for auction" and "conducting 2100 MHz auction", if the Authority still persists on conduct of auction, then additional sources for 900 MHz can be as under :**

- **Other non-telecom users of 900 MHz spectrum. E.g. – Defence, Railways.**

- **E-GSM spectrum: The TRAI, in its earlier recommendation dated 09.09.2013 had already recommended to DoT on need to check the feasibility for adoption of E-GSM band. In fact we had submitted earlier that with declining CDMA subscribers/ usage and in order to address issues of continuity of 900 MHz subscribers as also for providing opportunities for growth of broadband, E-GSM spectrum should be carved out of the currently unutilized spectrum in 800 MHz band, where some harmonization will be required.**

- **From BSNL, which currently has 6.2 MHz of 900 MHz band spectrum in all circles. It may be noted that BSNL currently has only 0.32 million VLR Subscribers / MHz in the 18 LSAs where licenses are expiring, as compared to 1.33 million VLR Subscribers / MHz for 29 licensees whose licenses**

are expiring in Dec'15 and early 2016. The choice of where should additional 900 MHz spectrum should come from for 3G deployment, if at all, is obvious from the aforesaid data, where BSNL's utilization of spectrum is at an abysmally low level of 25% relative to the private operators.

- **As has been highlighted in our introductory comments, for <u>fulfilling the government's objective of efficient use of spectrum and avoid hoarding</u>", BSNLs holding of 900 MHz (with much lesser number of subscribers) should also be revised to the new block size of 4.5 or 5 MHz. BSNL subscribers can be easily serviced by remaining 4.5MHz of 900 MHz and 1.8 MHz of 1800 MHz. In fact if BSNL's spectrum is reduced to 6.2 MHz (900+1800) in each circle, they will still have only 0.49 million VLR subscribers / MHz, which is significantly lower as compared to 1.33 million VLR subscribers / MHz for the expiring licenses (please refer Annexure A.1 for details).**

- **<u>Harmonization of Spectrum</u>**

  As has been brought out in the Consultation Paper, the spectrum allocation to the Operators at present is in a very fragmented manner, because of which operators cannot enjoy spectral efficiency that contiguous spectrum provides. Also contiguous spectrum is essential for launching new technologies like 3G and 4G. Another advantage of harmonization would be that some additional contiguous blocks could be created and auctioned.

  Moreover, BTS equipment supplied by vendors have an Instantaneous Bandwidth (IBW) of 35MHz in the 1800 MHz band. Thus operators are not able to use the spectrum allocated to them when it is spread over more than 35MHz by use of a single BTS. They perforce have to deploy two BTS to use the total spectrum allocated to them. Case in example is the Spectrum allocated to Idea Cellular in Delhi where the two blocks of 1800 MHz spectrum allocated to them have a separation of over 62 MHZ.

We therefore feel that there is an urgent requirement to carry out harmonisation so as to get maximum contiguous spectrum for launch of new technologies. For this <u>we feel following actions need to be taken upon Priority.</u>

a. Declaration of the Defence Band for 1800 MHz as proposed.

b. Based on this, readjustment and harmonisation of spectrum. This should include both the administratively allocated spectrum and the spectrum won in auction. It may be noted that the use of the administratively allocated spectrum for new technology would still be governed/ controlled by the DoT.

c. COAI has already made detailed suggestions LSA wise for the harmonisation of spectrum for all Operators to the DoT even before the Feb 14 auctions. We strongly recommend that this be done

before the proposed renewal auctions, as it would result in some additional contiguous spots in 1800 MHz being available for the next auction.

d. Another benefit of creating the Defence Band would be that all the partial spectrum allocations in the Feb14 auction and even the administered spectrum, would get regularised and available across the LSA.

e. A similar activity needs to be carried out in case of 900 MHz, where we find some 200 KHz gaps in the allocation of spectrum to BSNL. If these users are shifted to one end of the 900 MHz spectrum then an additional contiguous spectrum in 900 MHz would be possible.

Q.2. Please comment whether only contiguous blocks of minimum 5 MHz spectrum should be put for auction.

&

Q.3. What should be the block size to auction the spectrum in (a) 900 MHz band and (b) 1800 MHz band?

&

Q.4. What should be the minimum quantum of spectrum in the 900 MHz and 1800 MHz band that (a) a new entrant and (b) an existing licensee should be required to bid for?

&

Q.5. Should the licensee whose licences are due for expiry in 2015 and 2016 be treated as an existing licensee or as a new entrant?

1. **Firstly, we submit that there is absolutely no need for conducting auctions for the purpose of extending expiring licenses. Licenses should be extended based on mutually agreed terms as per provisions of the License Agreement.**

2. **Secondly**, the proposed auction for licenses expiring in 2015-16, violates the Government commitment made in NTP 1999, existing licensing conditions and even the Government's own press release of February 2012. Details have been highlighted in our Introduction.

3. **In case the licenses due for expiry are not treated as existing licenses and are forced into auction and such licensees fail to win current holding of 900 MHz spectrum used for GSM, then this would have the following impact :**

- Disruption of Telecom Services

  Currently India has 715 mn VLR subscribers (Jun'14) in the 19 non-metro circles. Out of these 387 mn VLR subscribers **(54%)** depend on GSM services provided by the 41 incumbent licensees holding 900 MHz spectrum whose licenses are expiring in Dec'15 or in the next few years. If we study the 29 licensees whose licenses are expiring in Dec'15 and early 2016, these account for 280 Mn out of

these 387 Mn VLR subscribers. By all accounts this is a large number of subscribers and any win of spectrum by a new entrant, which can only be at the cost of an incumbent licensee losing its spectrum and closing operations (unless more 900 MHz spectrum is made available) will result in serious disruption of services to the relevant subscribers. The magnitude of disruption will be huge.

- Significant shrinking of rural coverage

  In many rural areas, it is only the incumbent licensees who have a network and hence the closure of operations will leave the subscribers with no other alternative, but to be left helpless without telecom services. Nothing can be more detrimental to the cause of government policy of increasing rural coverage and reach of telephony to far corners of the country.

  The government is also trying to promote mobile banking as a vehicle of financial inclusion. The Honourable Prime Minister has already stated his vision of ensuring that every household in India should have a bank account. This vision will have a great setback if a large chunk of rural area would be left without mobile network coverage. We have tried to do an analysis of the extent of shrinking in coverage if the networks of 900 MHz private operators due for license extension were not available and the analysis of 4 circles (~90% accurate) are as under–

LSA (Circle)	Towns and Villages (nos.)			
	Total in LSA	Covered by 900 MHz private operators	Covered by other operators	Loss of coverage without 900 MHzlicensees due for extension
Maharashtra	41,747	32,905	16,230	16,675
UP West	39,748	36,654	25,181	11,473
Andhra Pradesh	28,913	21,455	9,855	11,600
Gujarat	18,674	15,061	6,829	8,232
Total	**1,29,082**	**1,06,075**	**58,095**	**47,980**

As can be seen from this sample, almost 45% (47,980 out of currently covered 106,075, towns and villages) stand to lose coverage if the 900 GSM networks of existing private operators due for license extension were unable to continue services. Also as can be see there is still significant number of towns and villages which need to be covered i.e. 23,007 (129,082 – 106,075) or about 18% and the objective of ensuring this coverage would never be achieved if the existing 900 MHz GSM networks were to discontinue their services or forced to pay immediate spectrum amount for extension of licensees beyond its intrinsic value..

- Disruption of services in Urban Areas – MNP is not the answer

  - Even in areas where other existing operators provide coverage, the fact that 54% of subscribers depend on the networks of incumbent licensees and such a large number of subscribers cannot be accommodated by these other networks. This is firstly not possible from

a network capacity perspective. More importantly the MNP systems are not designed to handle this magnitude of transfers.

- If any bulk porting takes place in future which is not foreseen, then there will be a huge impact at the operators and Clearing houses end and there would be major challenges on Dimensioning leading to Uncertainty, Complete Architecture Change, Signalling traffic Migration across Pan India for MNP Dipping, Threat of existing MNP getting impacted and Network Readiness of Other Operators. Besides there would be host of service delivery and IT related issues. The same is captured as per **Annexure H.**

- Auction of existing spectrum would lead to wastage of Telecom Assets

  - The life of the license was to mirror the life of the business, an elementary feature of any infrastructure investment. This was the Business Continuity Promise based upon which telecom companies made huge investments. Due to the proposed auction, the existing 900 MHz network of the Idea and other similarly placed operators may be left stranded leading to wastage of existing investments. Wasteful capital expenditure or a costly duplicate network will have to be rolled out by new operators who will have to set up an infrastructure/build coverage using an alternate spectrum (almost certainly requiring additional base stations).

IT IS WORTHWHILE TO MENTION THAT THERE IS NO SINGLE PRECENDENT IN ANY OTHER COUNTRY WHERE SPECTRUM CURRENTLY IN USE BY AN INCUMBENT LICENSEE WHICH IS MOST EFFICIENTLY UTILISED AND ON WHICH MORE THAN 50% OF THE SUBSCRIBERS DEPEND IS PUT TO AUCTION IN A MANNER WHERE THE INCUMBENT LICENSEE CAN POTENTIALLY LOSE THE SPECTRUM TO SOMEONE NEW ENTRANT.

4. **Further, the Authority needs to appreciate that the proposed Auction is different from the Feb'14 auctions**

The proposed auction is very different from the Feb'14 auction for expiring licenses, as can be seen from the table below.

	No. of LSAs	No. of Expiring Licenses	Spectrum Available for Auction (MHz)			Spectrum Available per LSA (MHz)			Spectrum Available per Licensee (MHz)		
			900	1800	Total	900	1800	Total	900	1800	Total
1. Feb'14 Auction	3	6	46.0	69.4	115.4	15.3	23.1	38.5	7.7	11.6	19.2
2. Proposed Auction											
a. 5 LSAs ≥ 14 Mhz of 900 Mhz Spectrum	5	10	71.6	12.6	84.2	14.3	2.5	16.8	7.2	1.3	8.4
b. 13 LSAs < 14 Mhz of 900 MHz Spectrum	13	19	112.4	86.2	198.6	8.6	6.6	15.3	5.9	4.5	10.5
Total	**18**	**29**	**184.0**	**98.8**	**282.8**	**10.2**	**5.5**	**15.7**	**6.3**	**3.4**	**9.8**

i) As would be seen from the above, there is limited availability of 900 MHz for any new entrant to come in. Hence other than the 5 circles, a new entrant can come in only at the cost of an incumbent licensee losing spectrum and closing operations.

ii) There is a constrained availability of 1800 MHz spectrum to substitute the quantum of 900 MHz being reduced. Hence, in many circles the overall spectrum is inadequate to be able to reduce the current holding of 900 MHz to create a new slot of 5 MHz to be deployed for 3G, if at all.

iii) There is no availability of fall back spectrum in 1800 MHz band for any incumbent licensee who fails to win 900 MHz spectrum in the auction.

iv) In Feb'14 auctions in the 3 metros, 11.6 MHz of 1800 MHz spectrum per licensee was available in the 1800 MHz band. Hence, in the event of the incumbents failing to win the 900 MHz spectrum, they had adequate fall back spectrum available in 1800 MHz to ensure continuity of their operations (it may be clarified that while this fall back was available, this is not desirable, because replacing a 900 MHz network with an 1800 MHz network will result in a colossal waste of equipment, money and time - please refer to our earlier reference to Analysys Mason report at Annexure D wherein it has been highlighted, "*the overall process of migration from 900MHz to 1800MHz may take up to three years for completion, during which the quality of service will be severely hit*".). As against this in the proposed auction there is only 3.4 MHz per licensee of 1800 MHz spectrum available, which is not adequate to continue GSM services and hence in the event of inability to win 900 MHz by any of the incumbent licensees, closure of operations in the specific LSA is inevitable.

v) The consultation paper at page 8, states "*that some of these TSPs have acquired spectrum in some LSAs in the 1800 MHz band in the November 2012/February 2014 auctions, as discussed later in this Chapter. Therefore, they will have some backup arrangement, though not a very preferable one, if they fail to get back spectrum in the 900 MHz band*."

At the outset let us clarify that while this is theoretically possible, but in practice this will result in closure of operations for a fairly long period of time while shifting is done from 900 MHz spectrum to 1800 MHz spectrum impacting a very large number of subscribers who will then be forced to port to other service providers.

However, even if one were to consider this as a possibility despite the impracticality, there are many circles where the 1800 MHz spectrum is not available for the full circle. In Idea's specific case, there is no fall back spectrum available in 1800 MHz band if we fail to win 900 MHz spectrum in the auction in the following 6 circles out of 9.

Circle	**Status of 1800 MHz spectrum won in Feb'14 auctions** **(in all cases wherever we have referred to 5 MHz spectrum slots, these are intended to be used for LTE and deploying the same for GSM is not desirable).**
Gujarat	Idea won only 1.6 MHz spectrum
Haryana	Idea won 5 MHz spectrum, which is not available in Sirsa and is not adequate for handling the traffic as our current spectrum is 6.2 MHz in 900 MHz band

Karnataka	Idea won 5 MHz which is not adequate as our current spectrum is 6.2 MHz in 900 MHz band.
Maharashtra	Idea has only 4 MHz of spectrum which is available throughout the circle. The 5 MHz block is not available in the main areas of Pune and Nasik.
Punjab	Idea won only 3 MHz which is available across the circle. The 5 MHz block is not available in the main areas of Amritsar and Ludhiana.
UP (West)	Idea did not win any 1800 MHz spectrum

The availability of partial spectrum would affect continuity of services not only in the specific districts, but also adjoining areas and districts resulting in a cascading effect on existing/ regular subscribers which will lead to a mass exodus even in other locations where there is fall back option; A 'Black out' is an imminent and real possibility in above areas. **The effect is diametrically opposite to the policy of the Government which is 'to connect the unconnected'.** The Authority needs to consider the impact of such partial allocation on continuation of services without massive disruption and quality degradation.

5. Please refer our earlier submissions, The TRAI should recommend immediate release and auction of 2100 MHz and the auction of 900 MHz, if any (in our opinion no auction of 900 MHz is required unless an extra block for a new operator can be created with additional spectrum), can be held concurrently.

6. However, despite the above, if there is a need to release some 900 MHz for 3G, it cannot be based on taking away 900 MHz spectrum from current holders of 900 MHz (incumbent private licensees) who have invested in networks on that frequency band over the last 20 years. It also cannot be based on any scenario where there is no adequate total spectrum available (including 1800 MHz) for continuation of GSM services by the existing licensees of 900 MHz.

7. As has been highlighted in our Introductory comments, the **solution for 18 service areas with expiring licenses – extension or auction with some prerequisites is as under :**

   a. It may be noted that all the licenses are not coming up for renewal at the same time. In all the circles, the renewal of licenses (for holders of 900 MHz spectrum) until 2025 is as under –

Year	Private Operators	MTNL / BSNL
FY 16	29	-
FY 18	-	2
FY 19	1	-
FY 20	-	19
FY 24	7	-
FY 25	4	-
Total	41	21

b. Thus there will be renewals coming up almost each year and it is neither practical nor desirable to have auctions every time and so frequently. **Hence, auction as a means of addressing expiring licenses is not a viable proposition**.

c. Also if conducting auctions when very few licenses (as few as 1 or 4 in a year) are expiring is not feasible, **then the Authority needs to seriously consider how will expiring licenses be addressed** – we cannot have a situation where in a particular LSA some spectrum associated with some expiring licenses is auctioned now and in future in other cases it is extended.

d. **Thus it is best to make all the licenses co-terminus to avoid these issues which keep coming up with different licenses expiring at different times. Even if DoT does not want to extend the licenses for 10 years now, at the minimum licenses should be extended to Feb, 2020 (expiry year of BSNL licenses), so that the renewal of all non-metro licenses can be done together and these can thereafter be co-terminus. There are international precedents of regulators in other countries extending the licenses issued at different times to make them co-terminus. Examples of Belgium, Malta, Netherlands and Switzerland are given in Annexure G.**

e. The challenge being posed by the proposed auctions is the limited availability of 900 MHz spectrum. It may be noted that 900 MHz spectrum in most circles is with 2 private operators and a third slot is with BSNL. Even if licenses are not extended for 10 years as stated in the License agreement, at the least these should be extended upto the time when BSNL licenses come up for renewal (i.e. upto FY20 which is 4 years extension), so that the availability and distribution of 900 MHz spectrum can be optimized. This can be understood better with the details explained in the next section.

f. However, despite the above, if there is a need to conduct auction, it cannot be based on taking away 900 MHz spectrum from current holders of 900 MHz.

g. Our recommendation on quantity and block size, for existing/ new licensee is as under :

(i) **For 3G deployment on 900 MHz a contiguous block of at least 5 MHz is required. For continuation of GSM services on 900 MHz at least 4.5 MHz spectrum is required (this will be the base spectrum and in any case additional 1800 MHz will be required for capacity purposes).** Hence, the minimum availability of 900 MHz spectrum in an LSA for being able to release a single block for 3G will be as under in the following two scenarios –

- **One license is expiring - 9.5 MHz**(4.5 MHz for GSM and 5 MHz for 3G)

  There are 7 LSAs where a single license is coming up for renewal and none of these LSAs have a minimum of 9.5 MHz of 900 band spectrum.

- **Two licenses are expiring - 14.0 MHz** (2x4.5 MHz for GSM and 5 MHz for 3G)

  There are 11 LSAs where 2 licenses are coming up for renewal and only 5 of these LSAs have a minimum of 14 MHz of 900 band spectrum.

Based on these criteria, auction for 900 MHz is feasible in only 5 out of 18 LSAs which have expiring licenses.

ii) **Secondly besides availability of 4.5 MHz in 900 MHz band, additional 1.7 MHz is the minimum requirement in 1800 MHz for being able to handle the current subscribers that each of the incumbent licensees have.**

iii) **Hence, the minimum availability of total spectrum (including 1800 MHz) has to be at least 17.4 MHz (2x6.2 MHz for GSM and 5 MHz for 3G).** Out of the 5 circles mentioned in a (ii) above, only 1 circle has the minimum 17.4 MHz of spectrum available. However, if some more spectrum can be made available either in 900 MHz or 1800 MHz band in the remaining 4 circles (out of 5), auction may be possible in 5 circles (out of 18 where licenses are coming up for renewal).

iv) **Given that the availability of 1800 MHz is now limited and so 900 MHz will be the base spectrum for GSM services for incumbent licensees, the following are the minimum requirements for an auction to be conducted for renewal –**

- At least 2 licenses in a LSA should be renewed together by auction.
- At least 14 MHz (9.5 MHz in circles with single expiring license) of 900 MHz band spectrum should be available in the given LSA (to provide for 2 blocks of 4.5 MHz required for GSM operations and a new block of 5 MHz which can be deployed for 3G technology).
- At least 17.4 MHz of total spectrum (900 MHz and 1800 MHz) should be available in the LSA so that after carving out a 5 MHz block of 900 MHz, there is a total of 6.2 MHz of total spectrum available for each of the 2 incumbent GSM operators to ensure continuity of services to ~54% of subscribers in these LSAs.

If the above conditions are not met, then a new block of 900 MHz can only be won by a new operator at the cost of discontinuity of operations of an incumbent licensee. Based on the criteria above only 5 circles (out of 18) would qualify for auction, which are as under -

LSA (Circle)	Renewal Spectrum		Available with DoT	Total Spectrum
	900	1800	1800	(MHz)
Andhra Pradesh	14.0	4.0	-	18.0
Gujarat	14.0	2.0	-	16.0
Karnataka	14.0	2.2	0.8	17.0
Maharashtra	14.0	2.0	-	16.0
Punjab	15.6	1.6	-	17.2

In each of these circles the best would be to release 1 / 1.6 MHz of 900 MHz band spectrum from BSNL and create 3 contiguous blocks of 5 MHz each. This would also fulfill the requirement of having at least total 17.4 MHz spectrum in each of the above LSAs.

v) There are further 5 circles (out of 18) with spectrum as under –

LSA (Circle)	Renewal Spectrum		Available with DoT	With BSNL		Total Spectrum (MHz)		
	900	1800	1800	900	1800	900	1800	Total
Haryana	12.4	-	8.0	6.2	3.8	18.6	11.8	30.4
Himachal Pradesh	12.4	-	10.2	6.2	3.8	18.6	14.0	32.6
Kerala	12.4	1.8	1.0	6.2	3.8	18.6	6.6	25.2
Madhya Pradesh	12.4	1.8	-	6.2	3.8	18.6	5.6	24.2
Rajasthan	12.4	2.0	0.4	6.2	1.8	18.6	4.2	22.8

In these circles, it is not possible to create three blocks of 900 MHz out of 12.4 MHz currently available. Going by the rationale explained in point (i) above, the following are the options–

- The licenses of incumbent licensees with spectrum are extended till the time BSNL spectrum comes up for renewal at which time more 900 MHz spectrum will become available. In that case out of 18.6 MHz, the 3 GSM operators (including BSNL) can get 13.5MHz (3 x 4.5 MHz), which along with available 1800 MHz can ensure continuity of GSM operations. This will provide additional 5.1 MHz of 900 MHz spectrum, which can be deployed for 3G; OR

- In case the extension is not feasible and auction is to be conducted now, then the only way to prevent discontinuity of GSM operations of the incumbent operators would be by asking BSNL to release 1.6 MHz of 900 MHz spectrum to be made available in the current auction. This will still leave sufficient spectrum of 8.4 MHz (4.6 MHz of 900 MHz and 3.8 MHz of 1800 MHz) in 4 circles and 6.2MHz in Rajasthan to service their existing subscribers (which is still much higher than the minimum 6 MHz GSM spectrum proposed for the incumbent private operators who have much higher number of subscribers than BSNL).

vi) In the remaining 8 circles (out of 18), currently spectrum ranging from 4.4 MHz (1), 6.2 MHz (6) and 8.8 MHz (1) spectrum is available. This is because in all these circles (except NESA with 8.8 MHz), only one license is due for renewal. Such an auction if forced upon the incumbent licensees would be most unfair as that operator would be forced to bid any amount for continuity of its business or else fact closure of business in that LSA. This is definitely NOT the intention of TRAI / DoT and this cannot be a mechanism for fair price discovery. Hence, the only way to solve the renewal for these circles is to renew these only when the second private license is coming up for renewal or along with renewal of BSNL license, whichever is earlier based on the principles mentioned in para (i) above.

vii) A hybrid of above options could be to reserve 4.5 MHz of 900 MHz band spectrum for each expiring license and auction the rest. The price determined in the auction for the remaining spectrum can be used as the fair value for the purpose of extension. In such a scenario, it must be appreciated that in the last auction wherever sufficient spectrum was available (>= 15 MHz in 10 circles), the winning price was equal to reserve price. This clearly indicates that the reserve price was actually high and the fair value was actually below the reserve price.

8. **The above suggestions have been made to ensure the continuity of operations for the incumbent licensees. However, for this objective to be achieved, certain specific points will also have to be incorporated in the auction design / rules. These are listed below –**

a. For 900 MHz the block size should be 5 MHz where sufficient spectrum is available for all incumbent licensees (one or two as applicable) plus one new block of 5 MHz to be created. In case this is not possible, then block size should be reduced to 4.5 MHz,in which case the same cannot be deployed for new technologies**. Incremental quantities should be allowed to be bid in multiples of 0.1MHz (this was 1 MHz in the Feb'14 auction) given that the quantity of spectrum available is not in multiple of 1 MHz and is different in different circles. For the sake of clarity we want to reiterate that auction should not be conducted in circles with less than 14 MHz of 900 MHz band spectrum (9.5 MHz in case of single expiring license).**

b. There is a need to ensure that the existing licensees due for extension are given at least 4.5/5MHz if they are bidding for a block at a given price. In the Feb'14 auction, the provisional winners out of those who had bid at a given price were decided by a set of ranking rules whereby a bidder for a higher quantum could have got all the spectrum that it had bid for because of higher ranking and the lower ranked operator could be left without any spectrum. In this particular auction, the rules will have to be modified in a manner that –

c. Based on the minimum block size of 4.5 / 5 MHz, the first allocation should be made for 4.5/5 MHz to each existing licensee due for extension /bidder at a given price before any provisional winning allocation is made to a new entrant (anyone other than an incumbent licensee of 900 MHz spectrum) i.e. an existing licensee due for extension who had put a bid for a minimum block size should be ranked higher than a new entrant.

For example, if there is 14MHz available in 900MHz and there are three bidders with bids of 4.5, 5 and 10 MHz, all should be declared provisional winners for 4.5 MHz with existing licensees due for extension ranking above any other bidder; and then, the balance 0.5MHz should be allocated as per ranking. Further, if there are two bidders with bids of 4.5 MHz and 10 MHz, then both should be first allotted 4.5 each with ranking of existing licensees due for extension being higher than any other bidder and then balance should be allocated as per ranking.

d. **In case of 1800MHz, the authority should distinguish between existing licensees (licensees whose licenses are due for extension in 2015 and 2016) and a new entrant in a given LSA. Any new entrant bidding for 1800 MHz should be allowed to bid only for minimum quantum of 5 MHz and for any existing licensee the minimum bid size should remain at 0.2 MHz**

e. The existing licensees should be allowed to bid for 1800 MHz under 3 categories (2 options). These options would be chosen at the time of putting each bid in the auction and the allocation of spectrum against bids would need to be based on the choice made. The categories and the rationale for the options are explained below –

i) Allocation of 1800 MHz to be made only if allocation of 900 MHz is being made for a minimum block of 4.5 MHz. In this case allocation of 1800 MHz should be made only concurrently with 900 MHz and if the allocation of 900 MHz is < 4.5 MHz, then NO 1800 MHz should be allotted.
Rationale: This is relevant because an existing licensee would most likely be bidding for 1800 MHz to get 6.2 MHz or more of total spectrum (i.e. bidding for 1.7 MHz or more of 1800 MHz spectrum). In case such an existing licensee is allocated only 1800 MHz spectrum and no 900 MHz spectrum, it will not be able to use the 1800 MHz spectrum at all and it will be a waste of spectrum for him and also a waste of national resource.

ii) Only full allocation of 1800 MHz to be made and if the full allocation cannot be made based on availability and ranking then NO allocations of 1800 MHz spectrum should be made.
Rationale: This is relevant because an existing licensee would select this option where it wants this as a fall back spectrum (including a scenario where the existing licensee takes this as a top up spectrum to the 1800 MHz already available with it) in the event it is unable to bid further for 900 MHz spectrum. In such a case if it does not get the full bid quantity, it will not be able to use the 1800 MHz spectrum at all and it will be a waste of spectrum for him and also a waste of national resource. For example, if an existing licensee has got 2 MHz of 1800 MHz spectrum and bids another 2.4 MHz to get to 4.4 MHz of total 1800 MHz spectrum, then it will not want an allocation of less than 2.4 MHz, because it will not be able to use less than 4.4 MHz of total spectrum for any purpose.

f. The last is a default category whereby normal rules of auction will apply.

9. In general the auction design should be such that the 900 MHz spectrum is first secured for existing licensees whose licenses are due for extension to avoid discontinuation of their operations, maximum spectrum is made available in contiguous blocks and frequency allocation rules are transparently announced to the bidders before the auction.

Based on the above explanation, the response to specific questions is as under –

1. **After ensuring that at least 4.5 MHz of 900 MHz spectrum is secured for licenses due for extension, the balance spectrum should be auctioned. Wherever contiguous blocks of 5 MHz are created in the remaining spectrum, the same should be so auctioned. However, if there are no contiguous blocks of 5 MHz available, then the balance spectrum should still be auctioned, because there is still a need for smaller blocks of spectrum. There is a difference in the value of contiguous blocks of 5 MHz and other spectrum and this subject has been dealt with in the later sections.**

2. **In case of 1800 MHz, the block of spectrum should be 0.2 MHz In any case this will be necessary given the different lots of spectrum available.**
   In case of 900 MHz, if 5 MHz blocks can be created by getting additional spectrum (while ensuring adequate spectrum availability for 900 MHz for continuing GSM operations), then the block size should be 0.2 MHz (same as 1800 MHz). However, if the minimum bid quantity is 4.5 MHz (and not 5 MHz), then there may be a need to have an incremental block size of 0.1 MHz

3. **As regards minimum quantum of spectrum to be bid, these are as under –**

   a. **New Entrant (defined as anyone who does not have licenses due for extension in a given LSA)**
      i. **900 MHz – minimum 5 MHz**
      ii. **1800 MHz – minimum 5 MHz**

   b. **Existing licensee (any licensee with license due for extension in 2015 or 2016 in a given LSA)**
      i. **900 MHz – minimum 4.5 MHz (or 5 MHz where 15 MHz or more spectrum is available)**
      ii. **1800 MHz - minimum 0.2 MHz**

4. **The auction is proposed to be carried out for addressing the licenses due for extension and if an auction is carried out for the same, the pre-requisite is that the continuity of operations of such licensees and their services to ~280 million VLR subscribers should be ensured. Hence, it is important that these should be treated as existing licensees (as shown in 3 above) and they should be allowed to bid for less than 5 MHz of 900 MHz spectrum and should be allowed to bid for a minimum of 0.2 MHz of 1800 MHz spectrum.**

OVERVIEW FOR QUERIES VALUATION AND RESERVE PRICE OF SPECTRUM (Q.6 TO Q.28)

Again before we respond to specific questions, we are giving below an overview of the rationale for our responses –

The valuation of spectrum can be done for 2 purposes –

A. For determining the reserve price of spectrum for a proposed auction.
B. For using as the final value of spectrum for the purposes of extending the spectrum attached to expiry of licenses and for any such other specified purpose.

Determination of Reserve Price of Spectrum

1. The following are the relevant points with respect to this purpose -

   a. **The actual price is determined in the auction based on demand and supply.** The reserve price sets a base level from which bidding starts. Hence, it only needs to be a reasonable level which should generally be low enough for the demand to equal or exceed supply and high enough to ensure that genuine price discovery happens. This has also been the philosophy of the Authority in the past. We believe that a great level of accuracy is not necessary for this purpose as some variation in the reserve price will not impact the final discovery of price based on demand and supply.

   b. If we take the last few auctions our experience in these auctions has been as under –

      (i) **3G auction in 2010 – the reserve price was much higher than the administrative prices** prevailing at that time, but that did not prevent the winning price to be discovered at a much higher level (4.79 times the reserve price).

      (ii) **Nov 2012 auction – The reserve price here was fixed at very high levels (largely linked to winning bids in 3G auctions) and the main bids of any significant quantity were received only in cases where the existing operators (whose licenses were cancelled vide Supreme Court orders** and who already had significant sunk investment made between 2008 and 2012 in the respective LSAs) had no option but to acquire the spectrum irrespective of the price because of the investments already made. The demand for spectrum from bidders other than cancelled licenses was only 30MHz out of total of 295 MHz spectrum put up for auction, with 168.5 MHz of spectrum remaining unsold.

      In this auction no one participated in the auction for 800 MHz.

      (iii) **Mar'13 auction – in this auction no one participated in the 900 MHz and 1800 MHz auction** and the obvious reason as far as non-metro circles were concerned were the high reserve prices (despite reduction of reserve prices in 4 LSAs from Nov 2012 auction).

The only participation was in the 800 MHz segment (where the reserve price was reduced) and that too by a single bidder (Sistema Shyam), who only bid for regaining 8 of their 21 cancelled licenses and spectrum, as they also had no other option. In fact the prices were so high that they did not even bid for cancelled 13 LSAs where they had earlier made significant investments.

(iv) Feb'14 auction

This auction saw a good participation as **the reserve prices were recommended by TRAI by following a proper consultation process, using relevant economic models and bringing real market situation as basis for recommendation. Generally we believe that the prices discovered in this auction are close to the value of 1800 MHz for non-metro circle**s. However, there are some aspects which need to be kept in mind before using these winning prices as the value of spectrum. **One major difference between this auction and the Mar'13 auction as far as 1800 MHz is concerned was that in Mar'13 the usage of 1800 MHz for LTE was still an emerging scenario, whereas by Feb'14 it was clear that 1800 MHz will be used for LTE as long as 5 MHz contiguous blocks were available.**

c. Thus, **the learnings from the last four auctions are as under** -

(i) A relatively low reserve price is not a barrier to discovery of true value of the spectrum (eg. 3G auction in 2010), on the contrary, it aids in proper price discovery.

(ii) A relatively high reserve price puts operators in a situation of forced bid for higher than genuine economic value because of various reasons as under –

- Need to win spectrum at any cost (e.g. Bids by operators whose licenses were cancelled in Nov'12 and Mar'13 auctions).

- Uncertainty over further availability of spectrum e.g. 3G auction was only for 3 slots in each LSA in a market where there were on an average over 10 operators per LSA. Hence a clear road map for auctioning more spectrum is essential for a proper auction.

- **Putting bids in anticipation of getting contiguous spectrum, but landing up with non-contiguous spectrum with a much lesser value e.g. This was clearly the case in Feb'14 auction where operators were forced to bid together for contiguous and non-contiguous spectrum, which the Authority has acknowledged have very different values. The ranking rules are known, but when a bidder puts in a bid hoping to get contiguous spectrum, he is not aware whether he will get contiguous spectrum or not. Hence, in any further auctions contiguous blocks of 5 MHz other blocks should be treated as separate products for which separate bids should be put. The auction design of Feb'14 auction was faulty to this extent.**

(iii) Difference in value for 5 MHz contiguous blocks and other spectrum

There is a difference in the economic value of 5MHz contiguous blocks and other spectrum, because a 5 MHz contiguous block can be deployed for multiple technologies – 800 MHz for GSM and LTE, 900 MHz for GSM and 3G and 1800 MHz for GSM and LTE. As against this any non-contiguous spectrum cannot be utilized for any of the new and more efficient technologies. Hence, the economic value of these two types of spectrum are very different. This is corroborated by the experience that we have had in the auctions as under –

- In 3G auctions in 2010 all blocks were contiguous blocks and hence they got the best value for the spectrum.

- **In the Mar'13 auction, 800 MHz was put up for auction. The reserve price was purportedly lowered since complete 5 MHz was not being offered. However, since the blocks were less than 5 MHz, t**here was no bidding except from a single bidder who also bid for only 8 LSAs out of the 21 cancelled licenses. It is quite certain that if blocks of 5 MHz are put up for auction in the 800 MHz band we will see a much better participation and value discovery.

- In the Mar'13 auction for 1800 MHz no one participated even though contiguous blocks were available, because at that time the use of 1800 MHz for LTE was not established and value attributed by operators was based on deployment for GSM. However, by Feb'14 when the use of 1800 MHz for LTE was established, there was a healthy participation. The participation for 1800 MHz non-contiguous spectrum was not reflective of the true economic value because the auction design forced the bidders to bid together for contiguous and non-contiguous blocks.

(iv) In the Feb'14 auctions in the 19 non-metro LSAs, the results were as under –

Category of Circles	**No. of LSAs**		
	Total	**ADP = RP**	**ADP > RP**
Circles ≥ 15 MHz spectrum	11	10	1
- A Category	*3*	*3*	
- B & C Category	*8*	*7*	*1*
Circles < 15 MHz spectrum	8	-	8
- A Category	*2*		*2*
- B & C Category	*6*		*6*

ADP – Auction Discovered Prive RP = Reserve Price

As can be seen from above that in all 11 circles where adequate spectrum was available for auction (≥ 15 MHz), the spectrum was sold at Reserve Price, except in one circle. In other 8 circles where spectrum was < 15 MHz (as low as 2.4 and 4.4 MHz in 3 circles), the prices exceeded the reserve price. Also in the 10 circles where the ADP and RP were equal spectrum remain unsold in 9 circles. This is a clear indication that the reserve price was on the higher side and a better price discovery would have happened with a lower reserve price.

2. <u>In light of this our suggestions for fixing the reserve price for any proposed auction are as under –</u>

a. No fresh valuation exercise needs to be done for spectrum.

b. **For contiguous blocks of 5 MHz in 1800 MHz, only the reserve price as recommended by TRAI vide its recommendations of Sep, 2013 are acceptable and can be used for any proposed auction.** DoT had increased the reserve price recommended by TRAI while issuing the NIA for all "A" category circles, but in the 3 "A" category circles where this was done and a reasonable quantity of spectrum was available, the ADP was equal to RP and unsold spectrum was left in all LSAs. Hence, definitely the RP fixed for the "A" category circles was high and for any further auctions the recommendations made by TRAI in Sep, 2013 should be used.

c. As explained earlier there is a significant difference between the value of 5 MHz of contiguous spectrum and other non-contiguous spectrum. Hence, the reserve price of non-contiguous spectrum or contiguous spectrum < 5 MHz should be lower. **In our opinion the reserve price of spectrum which is not in blocks of 5MHz contiguous spectrum should be 2/3rd of the recommended reserve price for 1800 MHz in Sep, 2013.**

d. **For 900 MHz, we believe that adjustment for technical efficiency factor of 1.5 times is generally an acceptable figure, although with the current developments of 1800 MHz spectrum becoming the standard for 4G technology, the multiple should actually be lower than 1.5.**The valuation of 1800 MHz spectrum has considerably increased relative to 900 MHz once the ecosystem for use of 4G (LTE) on 1800 MHz has got well established. This was also the case in the Feb 2014 auction in India, where all Operators were bidding for 1800 MHz to use it for LTE. This is mainly because 1800 MHz can be used for LTE and give higher data speeds and capacity per MHz of spectrum as compared to 900 MHz which can generally be used only for 3G among the new technologies. 4G technology (deployed on 1800 MHz) can give a higher throughput by ~75% compared to 3G technology (deployed on 900 MHz).

In the consultation paper, TRAI has indicated that the technical efficiency factor could be higher than 1.5. However, we feel that technical efficiency should not only be seen from the physics point of view of transmission losses but also from the capacity of the technology that the particular spectrum band is being used for globally. The earlier figure of 1.5 was seen more from the number of sites required for coverage purposes. But even based on that, the technical advantage of 900 MHz gradually diminishes as capacity sites are added in a mature network. There is an overall limitation on the number of subscribers that any site can support with the available spectrum. Once that is reached, operators have to add additional capacity sites further improving the coverage and reducing the efficiency factor. The Capex and Opex efficiencies are fully realizable only till capacity sites are not required beyond the coverage sites. As has been explained at length earlier a relatively low reserve price does not prevent the discovery of true market price in an auction and hence there is no reason to keep the multiple as higher than 1.5x for reserve price of 900 MHz vis a vis 1800 MHz.

Hence the multiple of 1.5 can be applied separately for the reserve price of 1800 MHz recommended in Sep, 2013 for contiguous blocks of 5 MHz and also to the reserve price determined for other spectrum after applying a suitable discount to the price recommended in Sep, 2013 as suggested in "c" above.

Determining final value of spectrum for the purposes of extending the validity of spectrum

We have recommended earlier that the fair value of the spectrum determined in the Feb'14 auctions after some adjustments for outliers can be used as the value for extension of spectrum validity by 10 years as provided in the license agreement or at least the date where these licenses and spectrum become co-terminus with the BSNL licenses expiring in Feb'20 (extension by ~4 years). For this purpose we have analyzed the data of Feb'14 auction and the highlights are as under –

1. The Feb'14 auctions were a mix of auction of varying quantities of 1800 MHz spectrum varying from a minimum of 2.4 MHz to a maximum of 30.2 MHz of spectrum.

2. It is quite clear that economic value of spectrum in terms of what profit can be generated from it remains dependent on market factors and not on the availability or non-availability of spectrum.

3. Hence, if some LSAs (eg. Gujarat with 12 MHz and Maharashtra with 14 MHz) saw prices going up about 67% over reserve price and much higher than the price of Tamil Nadu which had 30.2 MHz of spectrum available, that does not mean that the economic value of Gujarat spectrum is higher than the economic value of Tamil Nadu, which is a much larger market with higher revenue base and more subscribers.

4. Another factor which pushed the bids for Maharashtra and Gujarat higher were the availability of only 1 contiguous block of 5 MHz(across full LSA) in these two LSAs as against 3 or 4 blocks available in other A category LSAs of AP, Karnataka and Tamil Nadu all of which cleared at Reserve Price with unsold spectrum left in Karnataka and Tamil Nadu.

5. Another issue which unnecessarily resulted in such a high value for Maharashtra and Gujarat was the auction design. If we take the example of Maharashtra one has to put in bids for the solitary contiguous block of 5 MHz which was available across the LSA, another contiguous block of 5 MHz partially available (excluded Pune and Nasik) and the other non-contiguous spectrum together. The ranking rules provided that the bidder for the higher quantity gets a higher ranking and the ability to get the contiguous block across the LSA. This resulted in unnecessary bidding for higher quantity to be able to get higher ranking to consequently be able to get sole contiguous block available across the LSA.

In summary, the clearing price with limited availability of contiguous spectrum across the complete LSA and also limited availability of total spectrum cannot be treated as the fair value of spectrum and the fair value needs to be determined by comparison of bidding behavior of other "A" category circles with adequate spectrum.

6. While in B and C categories also there were circles with inadequate availability of spectrum and thus it is not right to take the winning prices in such cases as the fair value of spectrum. However, to minimize the number of cases where adjustment is required, we have considered only the following two LSAs for adjustment for fair value.

   a. First LSA is UP (West) where only 2.4 MHz spectrum was put up for auction and because of this small quantity the winning price was 53% higher than the reserve price. If we compared the same with UP (East) with similar demographics and similar reserve price, the winning price was only marginally higher than the reserve price. We suggest that the fair value of UP (West) can be taken as equal to UP (East) as Rs.320 crores.

   b. In "C" category Assam had the same issue as Maharashtra – limited spectrum with only one contiguous block and hence the winning price was 5.16 times the reserve price. We suggest that the fair value of Assam and NESA with the same reserve price should be similar and hence the fair value of Assam spectrum can be taken as Rs.35 crores.

7. **Based on the above analysis we come to a fair value of Rs.6,446 crores for 5 MHz contiguous blocks of 1800 MHz for the 19 non-metro circles (please refer Annexure B).**

8. The fair value of 900 MHz can be derived taking a multiple of 1.5 times as discussed earlier for contiguous blocks of 5 MHz. **For spectrum other than 5 MHz contiguous blocks, the fair value can be taken same as the fair value of 1800 MHz without applying a multiple of 1.5 (as the technical efficiency benefit of 1.5x times for 900 MHz is negated by the inability to deploy these spectrum bands for new technologies).** As explained earlier, that this comparison can be established by comparing the winning prices of 800 MHz auction in Mar'13, which despite being the most efficient from a technical efficiency perspective, fetched lower prices overall then the 1800 MHz spectrum in Feb'14 auctions. **The proposed fair values of 900 MHz contiguous blocks of 5 MHz is given in Annexure B.**

We now proceed to address the query no. 6 to 28 as below :

Q.6. Should the valuation exercise for 1800 MHz spectrum be undertaken afresh for all the 22 LSAs?

There is no need for doing valuation of 1800 MHz spectrum afresh. The exercise done in Sep, 2013 holds good.

Q.7. Should the prices revealed in the February 2014 auction for 1800 MHz spectrum auction be taken as the value of 1800 MHz spectrum for the forthcoming auction in the respective LSA? Would the response be

different depending on whether the forthcoming auction is conducted within one year of completion of last round of auction of February 2014 or later?

&

Q.8. If the prices revealed in the February 2014 auction for 1800 MHz spectrum are taken as the value of 1800 MHz for the forthcoming auction, would it be appropriate to index it for the time gap (even if this is less than one year) between the auction held in February 2014 and forthcoming auction? If yes, what rate should be adopted for the indexation?

As explained in the introduction of this section dealing with valuation of spectrum, in our opinion –

1. **For the purpose of using reserve price for any proposed auction, the reserve price recommended by TRAI in Sep 2013 for 1800 MHz can be used (not the increased reserve price used by DoT in the NIA for some LSAs) for any contiguous spectrum blocks of 5 MHz. For other spectrum these need to be discounted to say 2/3rd as such spectrum has lower value.**

2. **The response will not be different whether the auction is conducted within or after one year of last round of auction.** The fundamental principle is that it is wrong to assume that value of spectrum increases with passage of time. We have also seen value of spectrum declining in some cases in the past. Also in any case reserve price is a base required to conduct an auction and true price discovery is a function of demand and supply in the auction. Hence, **there is no need for any indexation of value of spectrum and the reserve price.**

3. For the purpose of determining a value for spectrum to be used for extension of licenses, we have explained that the winning price discovered in the Feb'14 auction can be used as value of 1800 MHz contiguous blocks of 5 MHz with suitable adjustments to be made for the LSAs of Maharashtra, Gujarat, UP (West) and Assam (please see Annexure B for complete details), which saw abnormal prices because of low availability of total spectrum and only one or zero contiguous blocks of 5 MHz.
4. As mentioned earlier no indexation is required for this purpose also. However, if at all indexation is done, it should be based on a measure of inflation like CPI and not based on SBI PLR, which was proposed in the NIA for Feb'14 auction.

Q.9. What should be the criteria for defining a 'market clearing price'? Can the auction determined price be considered as market clearing price, when (i) the demand for spectrum is greater than the supply and when (ii) the demand is greater than or equal to the supply? Can the auction determined price be considered as the market discovered price?

The criteria for defining market clearing price should be as under –

1. **Adequate spectrum is put up for auction for a fair price discovery. In our opinion at least 15 MHz of spectrum in a band in a specific LSA should be put up for auction to consider the auction determined price to be the market clearing price; and**

2. **The demand for spectrum should equal or exceed supply of spectrum.**

If the above conditions are satisfied, the auction determined price can be considered as the market discovered price. We would also like to clarify that there are 2 categories of spectrum in each band in each LSA – these are spectrum available in contiguous blocks of 5 MHz each and other spectrum. In most LSAs where adequate spectrum was available in Feb'14 auction, the major quantum of spectrum sold was contiguous spectrum blocks of 5 MHz and hence the prices in the auction represent market discovered price only for contiguous 5 MHz blocks of 1800 MHz spectrum and no other spectrum.

Q.10. Should the valuation of spectrum and determination of reserve price be done only for those LSAs where market clearing price was not achieved for 1800 MHz spectrum in February 2014 auction?

&

Q.11. Should the auction determined price for LSAs where market clearing price was achieved in February 2014, be taken as equal to the value of spectrum?

&

Q.12. Should the market determined price be taken as the value of spectrum in all LSAs?

We have mentioned in our earlier discussion that while adequate spectrum was available only in 5 LSAs out of 19 non-metro LSAs. **However, based on concept of materiality**, we believe that **an adjustment of price in view of inadequate quantum of spectrum in 8 LSAs can be limited to only 4 LSAs, namely, Maharashtra, Gujarat, UP (West) and Assam is recommended.** We have suggested that for these 4 LSAs the price behaviour of other LSAs in the same category can be used to arrive at a fair value. It is quite illogical to say that based on the auction results, the value of spectrum in Gujarat is higher than that of Tamil Nadu. Hence, **the value of spectrum in these 4 outlier LSAs needs to be determined from comparable (as explained in detail in Annexure B) rather than using their winning price as the value of spectrum.**

As has been mentioned earlier that no adjustment is required for reserve prices. **However, for determining value of spectrum for extension of licenses the values arrived at in Annexure B can be used which are derived from the results of Feb'14 auction.**

Q.13. Should the value of spectrum in the LSAs where market clearing price was not achieved be estimated by correlating the sale prices achieved in similar LSAs where market clearing price was achieved with known relevant variables (paragraph 3.19)? If yes, please suggest which single variable is best suited for this purpose?

&

Q.14. Can multiple regression analysis be gainfully employed for this purpose given the limited number of sample data points?

&

Q.15. Should the value of spectrum in 1800 MHz band be assessed on the basis of producer surplus on account of additional spectrum?

&

Q.16. Is there any need for a change/revision of any of the assumptions adopted by the Authority in producer surplus model in the Recommendations of September 2013? Justify with reasons.

&

Q.17. Should the production function model based on the assumption that spectrum and BTS are substitutable resources be used as a valuation approach (as was done in the earlier valuation exercise)? Please support your response with justification/calculations/relevant data and results.

&

Q.18. Should the revenue surplus approach be used to arrive at the value of 1800 MHz spectrum? Do you agree with the assumptions made?

&

Q.19. Should the values contained in the Report of 8th February 2011 for spectrum up to 6.2 MHz be incorporated after indexation in the calculation of the average value of the 1800 MHz spectrum in the current exercise?

&

Q.20. Should the prices revealed in the February 2014 auction for 1800 MHz spectrum auction be used as one of the values of 1800 MHZ spectrum?

&

Q.21. Apart from the approaches discussed as above, is there any other approach for valuation of spectrum that you would suggest? Please support your answer with detailed data and methodology.

&

Q.22. Would it be appropriate to value 1800 MHz spectrum as the simple mean of the values thrown up in all the approaches? If no, please suggest with justification that which single approach should be adopted to value 1800 MHz spectrum?

Since the TRAI had done a detailed valuation exercise for 1800 MHz spectrum less than a year back, no further value can be added by doing the same exercise again. We have already given our responses as regards what reserve price and value of spectrum should be used, when we are suggesting that a fresh valuation exercise is not required. The valuation of spectrum for 5 MHz contiguous blocks is contained in Annexure B.

Q.23. Should the value of 900 MHz spectrum be derived on the basis of the value of 1800 MHz spectrum using technical efficiency factors (1.5 times and 2 times) as discussed above?

And

Q.24. Should the economic efficiency approach as discussed above be used to calculate the premium for the 900 MHz spectrum, based on the additional CAPEX and OPEX that would be incurred on a shift from this band to the 1800 MHz band?

Q.25. Is there any other method that could be used for arriving at the valuation of the 900 MHz spectrum? Please support with detailed methodology.

and

Q.26. As in the case of the September 2013 Recommendations and adopting the same basic principle of equi-probability of occurrence of each valuation, should the average valuation of the 900 MHz spectrum be taken as the simple mean of the valuations obtained from the technical and economic efficiency approaches (and any other method)?

As explained earlier, we suggest that the value of 900 MHz spectrum can be derived by using a multiple of 1.5 times to the value of 1800 MHz spectrum. As explained above the relative value of 1800 MHz vis a vis 900 MHz has gone up because of 1800 MHz becoming the standard spectrum band for deploying 4G technology and hence there is no question of taking any multiple higher than 1.5. However, we need to distinguish between contiguous spectrum blocks of 5 MHz and other spectrum due to reasons explained in detail earlier and our suggestion is as under-

If A = Value of 5 MHz contiguous blocks of spectrum in 1800 MHz band determined from Feb'14 auctions for the 19 non-metro LSAs (as detailed in Annexure B)

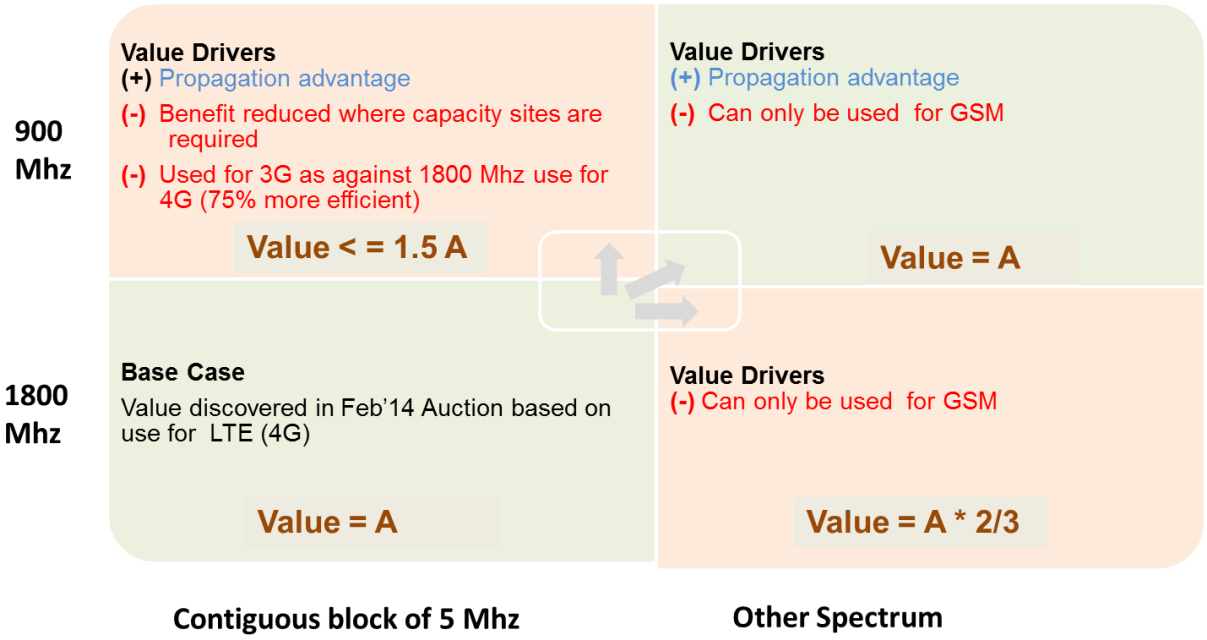
Then,

Value of spectrum other than 5 MHz contiguous blocks in 1800 MHz band = A x 2/3

Value of 5 MHz contiguous blocks of spectrum in 900 MHz band ≤ A x 1.5

Value of spectrum other than 5 MHz contiguous blocks in 900 MHz band = A

This is more clearly depicted in a graphical format as under –



Q.27. Should the reserve price of 1800 MHz spectrum in the forthcoming auction be fixed equal to the realized price of 1800 MHz spectrum in the February 2014 auction? If not, what should be the ratio between the reserve price for the auction and the valuation of the spectrum?

Q.28. If the realized prices in the February 2014 auction for 1800 MHz spectrum is taken as the reserve price of 1800 MHz for forthcoming auction, would it be appropriate to index it for the time gap (even if less than one year) between the auction held in February 2014 and forthcoming auction? If yes, what rate should be adopted for the indexation?

The realized prices in an auction cannot become the reserve price for the next auction. While this concept was contained in the NIA for 3G auction the inherent assumption in doing so is that the value of spectrum only increases over time, which is not the case (please refer to earlier submissions and also refer to Annexure I) . Value of spectrum can also decline over time. Hence, this condition was removed from subsequent NIAs which came after the 3G auction in 2010. Hence, as already stated, in the case of any proposed auction, the reserve price should be maintained at the same level as recommended in Sep, 2013 by TRAI.

The multiples of 2/3rd for reserve price for spectrum other than contiguous spectrum blocks of 5 MHz and a multiple of 1.5 times from 1800 MHz to 900 MHz can be used for reserve price also, which is in line with the multiples suggested for the value of spectrum.

Annexure A

VLR SUBSCRIBERS AND SPECTRUM HOLDING

Circle (LSA)	No. of Licenses Expiring in 2015-16	VLR Subscribers (in mn)		Spectrum Holding (MHz)	
		Private Operators	BSNL	Private Operators	BSNL
Andhra Pradesh	2	32.2	6.4	18.0	10.0
Assam	3	10.0	1.0	18.6	10.0
Bihar	2	30.8	2.0	17.2	10.0
Gujarat	2	26.2	2.8	16.0	7.4
Haryana	2	8.8	1.7	12.4	10.0
Himachal Pradesh	2	3.6	1.2	12.4	10.0
Karnataka	2	24.2	4.0	16.2	10.0
Kerala	2	15.2	5.5	14.2	10.0
Madhya Pradesh	2	30.3	3.0	14.2	10.0
Maharashtra	2	35.1	4.8	16.0	10.0
North East	3	5.6	1.0	16.8	10.0
Orissa	2	11.4	2.8	14.2	10.0
Punjab	2	12.9	2.4	15.6	6.2
Rajasthan	2	24.8	2.7	14.4	8.0
Tamil Nadu	2	26.0	4.8	26.2	10.0
Uttar Pradesh (East)	2	33.0	4.7	15.4	10.0
Uttar Pradesh (West)	2	21.7	2.5	14.2	10.0
West Bengal	3	30.7	1.7	18.6	10.0
Jammu & Kashmir	2	4.1	0.9	10.6	8.0
Total	**41**	**387.0**	**55.8**	**301.2**	**179.6**

*VLR Subscribers as of June 30, 2014

Annexure A.1

COMPARISON VLR SUBSCRIBERS PER MHZ OF SPECTRUM

Circle	No. of Licenses expiring in 2015-16	Private Operators			BSNL			Multiple for Pvt operators Vs BSNL
		VLR (mn)	GSM Spectrum Holding**	VLR (mn) /MHz	VLR (mn)	GSM Spectrum Holding	VLR (mn) /MHz	
Andhra Pradesh	2	32.2	18.0	1.79	6.4	10.0	0.64	2.8
Assam	1	2.2	6.2	0.35	1.0	10.0	0.10	3.4
Bihar	1	9.1	8.0	1.14	2.0	10.0	0.20	5.8
Gujarat	2	26.2	16.0	1.64	2.8	7.4	0.37	4.4
Haryana	2	8.8	12.4	0.71	1.7	10.0	0.17	4.3
Himachal Pradesh	2	3.6	12.4	0.29	1.2	10.0	0.12	2.5
Karnataka	2	24.2	16.2	1.50	4.0	10.0	0.40	3.7
Kerala	2	15.2	14.2	1.07	5.5	10.0	0.55	1.9
Madhya Pradesh	2	30.3	14.2	2.14	3.0	10.0	0.30	7.1
Maharashtra	2	35.1	16.0	2.19	4.8	10.0	0.48	4.6
North East	2	3.9	12.4	0.31	1.0	10.0	0.10	3.2
Orissa	1	3.5	6.2	0.56	2.8	10.0	0.28	2.0
Punjab	2	12.9	15.6	0.83	2.4	6.2	0.39	2.1
Rajasthan	2	24.8	14.4	1.73	2.7	8.0	0.34	5.0
Tamil Nadu	1	12.7	7.2	1.76	4.8	10.0	0.48	3.6
Uttar Pradesh (East)	1	16.5	8.2	2.02	4.7	10.0	0.47	4.3
Uttar Pradesh (West)	1	12.1	8.0	1.51	2.5	10.0	0.25	6.1
West Bengal	1	7.2	6.2	1.17	1.7	10.0	0.17	7.0
Total	**29**	**280.7**	**211.8**	**1.33**	**54.9**	**171.6**	**0.32**	**4.1**

*VLR Subscribers as of June 30, 2014

** excluding spectrum acquired in Nov'12/Feb'14 Auction

Annexure B

FAIR VALUE OF 1800 MHZ AND 900 MHZ SPECTRUM FOR THE PURPOSE OF EXTENSION OF LICENSES (19 LSAs)

Rs crores

Category	LSA	Price/ 5MHz (1800 MHz) (In Rs Crores)			1800 MHz Spectrum Auctioned		Fair Value -1800 Mhz (In Rs Crores)		Remarks	Fair Value of 1800 band 5 MHz contiguous blocks	Fair Value of 1800 band other spectrum	Fair Value of 900 band 5 MHz contiguous blocks	Fair Value of 900 band other spectrum
		Reserve	Winning	Change	Qty	Contiguous block across LSA	Winning Price	Adjusted					
A	Karnataka	775	775	-	25	4	775			775	517	1,163	775
A	Andhra Pradesh	815	815	-	23	3	815			815	543	1,223	815
A	Tamil Nadu	1,040	1,040	-	30	4	1,040			1,040	693	1,560	1,040
A	Gujarat	715	1,189	66.3%	12	1		715	Inadequate total spectrum and low qty of contiguous spectrum resulted in abnormal price . Adjusted fair value should be equal to Reserve Price, in line with other A category circles with adequate spectrum	715	477	1,073	715
A	Maharashtra	865	1,452	67.8%	14	1		865		865	577	1,298	865
B	Rajasthan	130	130	-	21	0	130			130	87	195	130
B	Haryana	135	135	-	16	0	135			135	90	203	135
B	Kerala	260	260	-	28	5	260			260	173	390	260
B	Punjab	270	270	-	18	1	270			270	180	405	270
B	West Bengal	105	123	17.1%	13	0	123			123	82	185	123
B	Madhya Pradesh	215	252	17.2%	19	2	252			252	168	378	252
B	Uttar Pradesh (E)	305	320	4.9%	10	0	320			320	213	480	320
B	Uttar Pradesh (W)	310	475	53.1%	2	0		320	Inadequate spectrum resulted in abnormal price . Fair Value is taken as equal to winning price for UPE.	320	213	480	320
C	Himachal Pradesh	30	30	-	20	1	30			30	20	45	30
C	Orissa	80	80	-	28	5	80			80	53	120	80
C	Bihar	185	216	16.5%	4	0	216			216	144	323	216
C	Jammu and Kashmir	25	31	22.0%	6	0	31			31	20	46	31
C	North East	35	35	-	27	2	35			35	23	53	35
C	Assam	35	181	415.7%	11	1		35	Inadequate spectrum resulted in price increase. Fair Value is taken as equal to winning price for North East.	35	23	53	35
										6,446	**4,297**	**9,669**	**6,446**

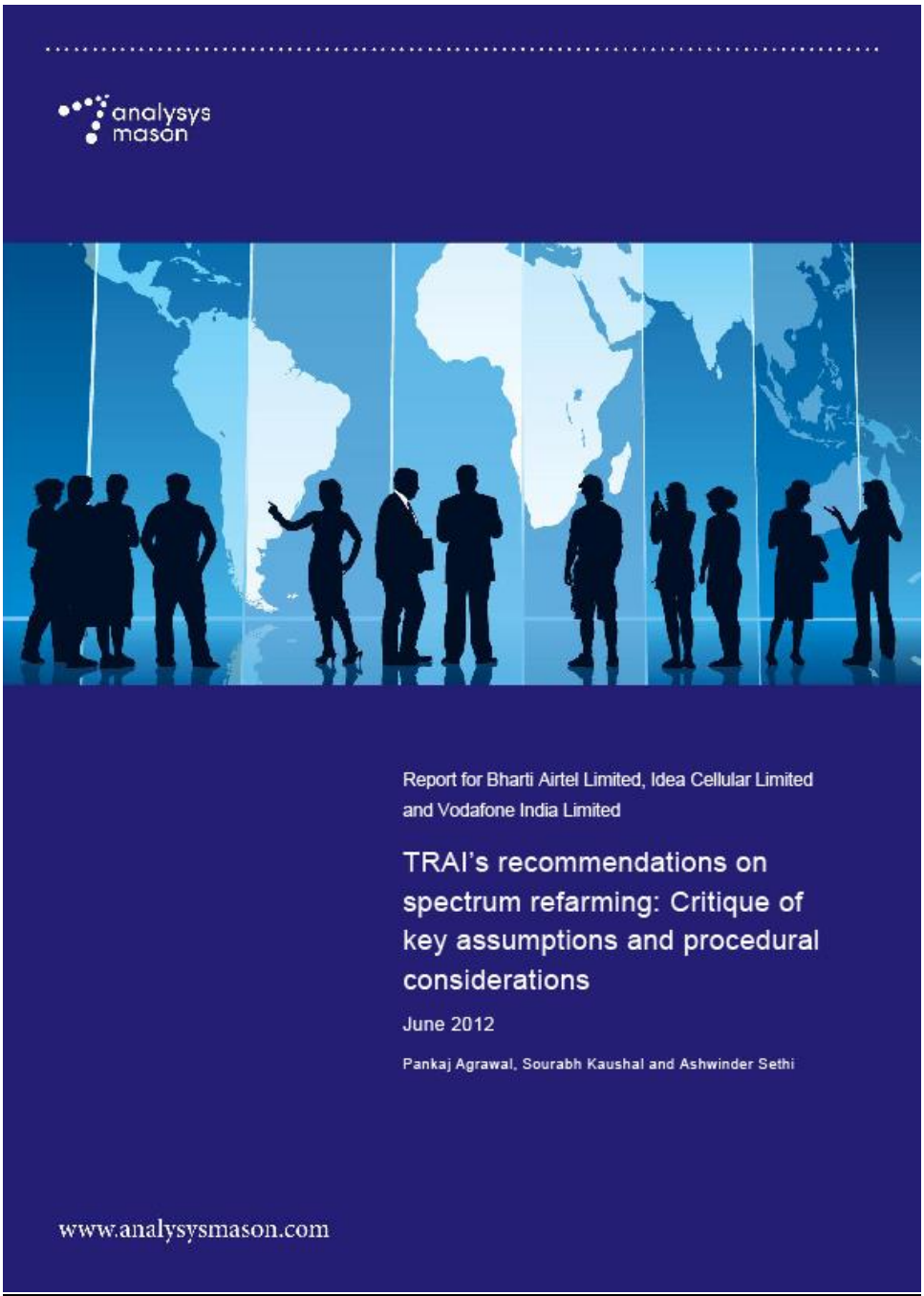
Annexure C

POTENTIAL REVENUE (RS. CRORES) FOR GOVERNMENT ON EXTENSION OF LICENSES (18 LSAs)

	Fair Value for 5 MHz (Annex. B)		Renewal Spectrum		Co Terminus with BSNL		
Circle	**1800**	**900**	**900MHz**	**1800MHz**	**900 MHz**	**1800 MHz**	**Total**
Andhra Pradesh	815	1,223	14.0	4.0	717	137	854
Assam	35	53	6.2		14	0	14
Bihar	216	323	6.2	1.8	84	16	100
Gujarat	715	1,073	14.0	2.0	629	60	689
Haryana	135	203	12.4		105	0	105
Himachal Pradesh	30	45	12.4		23	0	23
Karnataka	775	1,163	14.0	2.2	643	68	711
Kerala	260	390	12.4	1.8	203	20	222
Madhya Pradesh	252	378	12.4	1.8	196	19	215
Maharashtra	865	1,298	14.0	2.0	760	73	832
North East	35	53	8.8	3.6	19	5	25
Orissa	80	120	6.2		31	0	31
Punjab	270	405	15.6		255	0	255
Rajasthan	130	195	12.4	2.0	97	10	107
Tamil Nadu	1,040	1,560	6.2	1.0	405	44	449
Uttar Pradesh (E)	320	480	6.2	2.0	125	27	152
Uttar Pradesh (W)	320	480	6.2	1.8	125	24	149
West Bengal	123	185	4.4	1.8	34	9	43
Total			**184**	**28**	**4,466**	**512**	**4,977**

Note:
The value has been calculated separately for each license for the period from the date of expiry of each license till Feb'20, when the licenses of BSNL expires

This value is based on contiguous blocks of 5 MHz or more in 900 MHz. In case the blocks are other than contiguous blocks of 5 MHz in all LSAs then the potential revenue will be Rs.3,318 crores (4,977 x 2/3)


analysys mason
Report for Bharti Airtel Limited, Idea Cellular Limited and Vodafone India Limited
TRAI's recommendations on spectrum refarming: Critique of key assumptions and procedural considerations
June 2012
Pankaj Agrawal, Sourabh Kaushal and Ashwinder Sethi
www.analysysmason.com

Contents

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1 Executive summary

The latest recommendations of TRAI on auction of spectrum[1] propose the refarming of 900MHz spectrum in-lieu of assignment of 1800MHz spectrum.

Unfortunately, there isn't any comprehensive document which explains the rationale for these recommendations, outlines the approach adopted to arrive at this conclusion, and evaluates the implications on consumers and stakeholders. If we review the consultation papers, recommendations, operator submissions and associated documents on spectrum refarming in India, we find that the issue of refarming has been brought up by TRAI in consultation documents which were primarily meant to address other spectrum management issues. There is a consistent trend of such out-of-context inclusion of refarming discussion across multiple consultation papers and recommendations from 2009 onwards.

Another point to note is the consistent avoidance of a dedicated consultation paper for spectrum refarming, despite TRAI itself acknowledging the need for such a consultation paper in its various consultations and recommendations. In addition, operator responses have also repeatedly mentioned that a separate, dedicated consultation process for refarming is imperative. However, these requests and commitments have been consistently ignored, with only a superficial treatment of the impact of refarming in TRAI consultation documents.

In this report we do three things:

- We assess the impact of refarming by thoroughly examining its impact on consumers, the environment and business viability of operators in the India market
- We review how regulators in international markets have examined the refarming issues
- We evaluate TRAI's assumption that so-called liberalisation of 900MHz and 1800MHz spectrum will result in a material increase in value of these bands

Assessing the impact of refarming on consumers, the environment and operators

The first three operators in each circle in the Indian mobile market were initially assigned the 900MHz spectrum band to start their operations, and built their networks using the 900MHz band. Over years, operators with 900MHz spectrum (seven operators in total, including BSNL and MTNL) have expanded their networks to include rural areas and now have a substantial presence across urban and rural areas (100% population coverage in urban areas and 80% population coverage in rural areas).

Given that operators with 900MHz have deployed 900MHz base stations over years, and the TRXs to upgrade these bases stations are not available with OEMs, the 900MHz base stations will need to be replaced with 1800MHz base stations. To provide equivalent coverage, operators will also need to

[1] Recommendations on auction of spectrum, Telecom Regulatory Authority of India, 23 April 2012

deploy additional sites on 1800MHz to address coverage gaps due to the radius differential between 900MHz and 1800MHz.

- We estimate that operators with 900MHz band will need to replace 286,590 base stations and install an additional 171,954 base stations to provide equivalent coverage on 1800MHz
- Such a replacement of base stations and deployment of additional sites will result in an incremental capex of INR 54,739 crores, and incremental annual opex of INR 11,762 crores
- If the incremental investment in refarming and the costs of spectrum are passed on to consumers in the form of enhanced retail voice tariffs, the overall tariffs will go up by as much as 64 paise per minute (30 paise due to refarming and 34 paise from spectrum investments), with a much higher impact on tariffs in non-Metro circles

Interestingly, the major capex impact is on account of the fact that existing operating networks will have to be replaced and will account for 58% of the total capex. The better propagation characteristics of 900MHz band as compared to 1800MHz band will have a smaller contribution to this overall impact.

In addition, operators will also have to write-off their existing 900MHz assets at an estimated cost of INR 22,310 crores. At an industry level, an additional capex of about INR 26,653 crores will be required to deploy new towers to support the incremental base stations.

In the scenario that operators with 900MHz spectrum are not able to provide equivalent coverage due to business case and operational feasibility, then there is a risk of reduction in geographic coverage by as much as 40%. Such a reduction of coverage is estimated to directly impact the connectivity to about 70 million subscribers, and other consumers trying to reach them. Also, the business case for a new operator acquiring 900MHz spectrum at the proposed prices will not allow for expansion to rural markets to address these coverage gaps.

Finally, the installation of additional sites will increase diesel consumption and contribute to environmental pollution equivalent to that of an additional 4.5 million cars.

Practice followed by other regulators

An analysis of the spectrum refarming approach adopted by regulators in other markets indicates the striking lack of rigour, detail and comprehensiveness in the consultation process adopted by TRAI for developing the refarming recommendations. We find that in markets where refarming consultations have been carried out, regulators have considered a major sub-set of the following issues:

- Consumers: service quality and coverage, impact on tariffs, and service continuity
- Technology maturity, existing demand and adoption curve
- Operator business case, investment and network plan
- Economic outcomes: impact on tele-density, rural coverage and overall economy
- Spectrum pricing and auctions: basis of determining auction price
- Competition: market parity and competitive landscape

The second important aspect to be considered in such a comparison is that full withdrawal of spectrum from an operational network remains unprecedented. Partial withdrawal has generally happened to allow entry for new operators, but has impacted only a marginal portion of the overall spectrum holdings. Even in such a situation, the regulator carried out the withdrawal activity through collaborative discussions with service providers.

Finally, key issues around operational implementation have been not considered. For hot swapping of customers from one network to another, the availability of both spectrum bands (900MHz and 1800MHz) is required. The availability of such spectrum for the transition period is assumed, although the financial implications of operators holding both the spectrum bands for 18 months has not been commented upon by TRAI. The regulatory uncertainty will either result in operators not making further investments in 900MHz network, or writing off the investments made during the next 2 to 3 years.

Impact of refarming on the value of spectrum

TRAI believes that refarming of spectrum in the 900MHz band will allow for more efficient use of spectrum and ultimately result in higher revenues for operators through deployment of new technologies. This is more of an academic argument as current market conditions in India suggest that the so-called liberalised 1800MHz spectrum will continue to be primarily used for providing voice services using GSM technology, and the objective of absolute revenue enhancement from increased penetration of data services will not be realised in the near foreseeable future.

- Operators using 900MHz spectrum currently support 51% of the total mobile user base, and even if this user base is migrated to the so-called liberalised 1800MHz band, operators will still need to provide GSM based voice services to this user base until at least 2025
- Also, the market for data services is still immature in India and likely to be adequately served by 3G in 2100 MHz for the foreseeable future. The key is that compared to 2100UMTS, the 1800LTE technology and device ecosystem remains relatively nascent, which will get reflected in device prices, service affordability and adoption issues
- Also all the proposed new technologies (UMTS, LTE) to be deployed on the so-called liberalised spectrum need at least 5MHz of spectrum. The availability of limited spectrum coupled with the need to support voice users makes the liberalisation argument hypothetical
- Finally, anecdotal evidence suggests that there already exists a technology neutral environment in India. An evaluation of various documentation and responses by the Department of Telecommunications, and market evidence of some operators using the 800MHz spectrum in a liberalised fashion to provide EVDO-based data services suggests that the technology environment in India remains liberalised

Conclusions and next steps

In summary, the proposed refarming will have a substantial cost to the industry, increase retail tariffs and cause significant inconvenience to consumers as also adversely impact the environment, with no benefit to any stakeholder.

2 Introduction

Bharti Airtel Limited ('Bharti Airtel'), Idea Cellular Limited ('Idea Cellular'), and Vodafone India Limited ('Vodafone India') have commissioned Analysys Mason Limited ('Analysys Mason') to examine the recommendations proposed by the Telecom Regulatory Authority of India ('TRAI') on spectrum refarming in April 2012[2], and critically evaluate the underlying rationale and procedural considerations in developing these recommendations.

Analysys Mason is a trusted adviser on telecoms, technology and media. With around 235 staff in 12 offices, we are respected worldwide for our exceptional quality of work, independence and flexibility in responding to client needs. For 25 years, we have been helping clients in more than 100 countries to maximise their opportunities. Our headquarters are in London and we have a presence in Cambridge, Dubai, Dublin, Edinburgh, Madrid, Manchester, Milan, New Delhi, Paris, Singapore and Washington DC.

The remainder of this document is laid out as follows:

- Section 3 reviews TRAI consultations on spectrum refarming since 2009 to provide a background for the current recommendations on refarming of 900MHz spectrum
- Section 4 focuses on evaluating the impact of refarming of 900MHz spectrum on consumers, the environment and business viability of operators in the Indian market
- Section 5 analyses the practice adopted by regulators in international markets for spectrum refarming, including the consultation process and approach
- Section 6 evaluates the critical assumption that liberalisation of the existing 900MHz and 1800MHz spectrum bands will result in a material increase in their value
- Annex A includes results and assumptions of our model to quantify the impact of refarming of 900MHz spectrum on consumers, the environment and business viability of operators in India

[2]Recommendations on auction of spectrum, Telecom Regulatory Authority of India, 23 April 2012

3 Regulatory context for spectrum refarming in India

It is imperative to understand the regulatory context leading to the build-up of the current recommendations on spectrum refarming. If we consider the consultation process, industry responses and subsequent recommendations of TRAI, we find that:

- The issue of refarming has been consistently brought up in consultation documents, apparently out of context, while TRAI is evaluating other elements of spectrum management process such as spectrum auction and pricing. There is a consistent trend of such out-of-context inclusion of refarming discussion across multiple consultation papers and recommendations from 2009 onwards
- The TRAI consultation papers and recommendations mention that the refarming of 900MHz spectrum will have a significant impact on operators, and hence necessitate a separate consultation process. Subsequent operator submissions have also repeatedly mentioned that a separate, dedicated consultation process for refarming is imperative. However, for some reason, these requests and commitments have been consistently ignored, with only a superficial treatment of the impact of refarming in consultation papers

The refarming discussion was started by TRAI in 2009, from a broader perspective of achieving the objective of "enabling spectrum to move to its most efficient users and uses". This included the objective of the use of spectrum band from current non-commercial uses (such as security, navigation) to commercial uses. In addition, this included allowing a band under commercial use to be reused for deploying a newer or advanced technology.

It's interesting to note that this consultation followed a reference from the Department of Telecom requesting the regulator to examine the report of an expert committee on the "Allocation of Access (GSM/CDMA) spectrum and pricing" and did not include refarming in its mandate. The committee report had mainly focused on spectrum allocation and pricing, as well as merger, transfer and sharing of assigned spectrum. TRAI also mentioned in this paper that additional issues which were not covered by the committee report also need to be addressed, specifically refarming of spectrum.

This consultation was followed by TRAI recommendations in May 2010[3], which expanded the scope of refarming to include the refarming of 900MHz spectrum, and grant of 1800MHz spectrum in lieu. The recommendations mentioned that, "*there is a need to carefully assess the likely impact of re-farming of 900MHz from the perspective of traffic management, frequency coordination, site optimization, management of voice & data traffic loads etc. as it poses significant challenges for operators. The Authority is of the opinion that even as there should be a definite decision to refarm the spectrum; the details are to be worked out in greater detail, for which a separate consultation process may be necessary*." However, no separate consultation was conducted by TRAI on the issue of spectrum refarming.

[3]Recommendations on Spectrum Management and Licensing Framework, 11 May 2010

The need for a separate consultative process to discuss the issues involved in reframing was again reiterated by TRAI in its November, 2011 response to DoT[4].

However, the detailed consultation process suggested in the 2010 recommendation and November 2011 letter was not addressed. In February 2012, the Hon'ble Supreme Court of India in its judgment dated 2ndFebruary 2012[5]directed the TRAI to make fresh recommendations, "for grant of licence and allocation of spectrum in 2G band in 22 Service Areas by auction, as was done for allocation of spectrum in 3G band."

TRAI floated a consultation paper on auction of spectrum in 2012[6] which included an analysis of spectrum availability by bands, proposed auction design and quantum of spectrum to be auctioned. However, in addition to these analyses, the consultation paper also included the issues of liberalisation of spectrum as well as reframing, and outlined three options for the reframing of 900MHz spectrum, and sought comments from industry participants.

The need for such a consultation was also stressed by some of the operators holding spectrum in the 900MHz band, before TRAI finalised its recommendations.

- In its response, Bharti Airtel mentioned that, "It is submitted that reframing of spectrum in 800/900 MHz band has larger implications and requires detailed deliberation on issues concerning continuity of services to the existing customers, financial implications, network re-engineering and optimization etc."
- Idea Cellular submitted, "We are surprised that the Authority has suddenly chosen to link the issue of reframing with the proposed auction process. We believe the topic of reframing of 900/800 MHz for its current GSM/CDMA use is a separate topic and the same needs to be properly discussed in the Public forum through a separate consultation process."
- Vodafone India in its response noted that "... issues pertaining to 'reframing' do not flow out of the Supreme Court judgment pursuant to which the TRAI is carrying out the present consultation…"

The need for a separate consultation process for reframing was again ignored by the TRAI, and in its April 2012 recommendations, it recommended that "reframing of 900MHz should be carried out 'progressively' and that this spectrum should be replaced by spectrum in the 1800MHz, which should be charged at the price prevalent at the time of re-farming."

In this report we do three things:

- We assess the impact of reframing by thoroughly examining its impact on consumers, the environment and operators
- We review how regulators in international markets have examined the reframing issues

[4] TRAI's response to DoT dated 3/11/2012 w.r.t. its reference to May, 2010 recommendations

[5] Writ petitions no 423/2010 and 10/2010

[6] Consultation paper on auction of spectrum, 07 March 2012

- We evaluate TRAI's assumption that so-called liberalisation of 900MHz and 1800MHz spectrum will result in a material increase in value of these bands

We find that the refarming proposed by TRAI will have significant detrimental effects on consumers in the form of higher prices and a poorer quality of service, on the environment because of higher energy consumption and on the long-term viability of operators.

We also show that TRAI's proposed approach is at odds with the practice followed by the regulators in international markets.

Furthermore, we do not believe that liberalising the use of 900MHz will lead to a material increase in its value because a) it is impractical to clear these bands given the demand for voice traffic, and b) the market for data services is still nascent in India and likely to be adequately served by 3G in 2100MHz for the foreseeable future.

4 Impact of refarming on consumers, the environment and operators

4.1 *Operators with 900MHz band will need to replace 286,590 existing base stations and install an additional 171,954 base stations to provide equivalent coverage on 1800MHz frequency*

The first three operators in each circle in the Indian mobile market were initially assigned the 900MHz spectrum band to start their operations, and built their networks using the 900MHz band. Over years, operators with 900MHz spectrum (seven operators in total, including BSNL and MTNL) have expanded their networks to include rural areas and now have a substantial presence across urban and rural areas (100% population coverage in urban areas and more than 80% population coverage in rural markets).

Given that operators with 900MHz have deployed 900MHz base stations over years, and the TRX to upgrade these bases stations are not available with OEMs, all these base stations will need to be replaced with 1800MHz base stations. On an overall basis it is reasonable to conclude that the 900MHz base stations for operators using 900MHz spectrum will need to be replaced with 1800MHz base stations in rural as well as urban areas. In addition to replacement of equipment, operators will need to deploy additional sites on 1800MHz band to fill coverage gaps, given the lower coverage radius achieved on 1800MHz versus 900MHz.

We find that at an overall level, the active equipment would need to be replaced on nearly 286,590 sites and additionally about 171,954 new sites would need to be deployed to provide equivalent coverage on 1800MHz frequency band. We estimate that the active equipment will need to be replaced on the existing 94,670 sites in urban areas, and an additional 56,802 base stations on 1800MHz will need to be deployed to provide equivalent coverage. In rural areas, we estimate that the active equipment will need to be replaced at about 191,920 site locations, and an additional 115,152 base stations. Please refer to Figure A.1 and Figure A.2 in Annexure for circle wise calculations.

4.2 *The replacement of 900MHz base stations and deployment of additional sites on 1800MHz will result in an incremental capex of INR 54,739 crores, and incremental annual opex of INR 11,762 crores*

We estimate the capex for replacement of 900MHz sites and deployment of new 1800MHz sites to be INR 18,082 crores in urban areas. For rural areas, the replacement capex and the incremental site capex is estimated to be INR 36,657 crores.

In addition, deployment of additional sites on 1800MHz will lead to an incremental annual opex of INR 11,762 crores in urban and rural areas. This includes tower rental, electricity and diesel charges, and

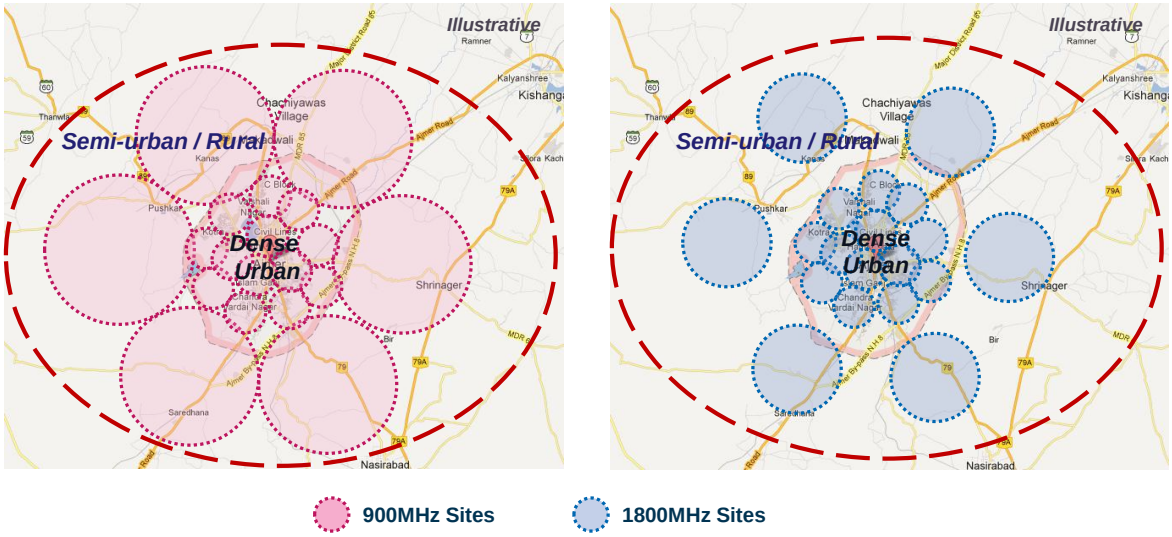
other associated costs for additional towers that will be deployed on 1800MHz spectrum band. Please refer Figure A.3 and A.4 in Annex A for circle wise calculations. Interestingly, the major capex impact is on account of the fact that existing operating networks will have to be replaced and will account for about 58% of the total capex. The better propagation characteristics of 900MHz band as compared to 1800 MHz band will have a smaller contribution to this overall impact.

In addition, operators will also have to write-off their existing 900MHz assets estimated at INR 22,310 crores. At an industry level, an additional capex of about INR 26,653 crores will be required to deploy new towers to support the incremental base stations.

4.3 *There is a risk of reduction of existing geographic coverage by as much as 40% and loss of connectivity for 70 million subscribers, in case operators do not match coverage due to business case viability and operational feasibility*

As the current network has been designed and built to a 900MHz frequency plan, the conversion of this network to 1800MHz frequency plan will result in severe coverage gaps, even with the use of small cell and in-building solutions to address coverage issues. The effect of switching from a 900MHz network to an 1800MHz network is illustrated in Figure 4.1.

Figure 4.1: Impact on network coverage due to migration from 900MHz to 1800MHz [Source: Analysys Mason]



Such a migration is bound to create a coverage discontinuity across residential and commercial areas, with an increase in number of call drops, at least during the period of migration and optimization, and most likely for many years in the foreseeable future. In some instances, there might be restrictions on the number of sites which can be deployed (such as in cantonment areas), which might also have an impact on coverage. The impact of migration to 1800MHz in urban areas will be primarily felt in terms

of deteriorating quality of service in urban areas, which includes commercial complexes, office buildings and public areas.

More importantly, at the current ARPU levels, increasing the capital expenses by 1.6x will have a significant impact on business viability of services in rural areas. Operators are likely to reduce the areas that they cover, which may result in a potential decline in rural tele-density. In such a situation, we believe that the geographical coverage could reduce by as much as 40%, primarily due to the lower coverage achieved using the 1800MHz band as compared to the 900MHz band.

Such a reduction of coverage is estimated to directly impact the connectivity to about 70 million subscribers. More importantly, due to the inherent two way nature of the communications business, the subscribers in other markets will also not be able to reach out to this 70 million user base, thus directly impacting the utility of their mobile connections.

In addition, this will also have a financial implication with a reduction in revenues for operators offering services in these areas.

4.4 *The overall process of migration from 900MHz to 1800MHz may take up to three years for completion, during which the quality of service will be severely hit*

The current 900MHz network has been deployed by operators over a period of about sixteen years, and it will take a significant amount of time to physically replace equipment on these 900MHz sites and build additional sites.

The current site deployment experience suggests that not more than 400 sites per month can be converted from 900MHz to 1800MHz for one operator. For an operator with 10,000 sites in a circle, such a migration plan will require more than two years for the network replacement and deployment to complete in that circle. For migrating all the existing 900MHz base stations to 1800MHz, along with deployment of additional 1800MHz sites on an all India basis, we believe that up to three years will be required for the two900MHz private operators in each circle.

In this transition phase of migration from 900MHz to 1800MHz frequency, the overall quality of service will suffer as the networks will need to be kept live for a hot swap and it will take some time to optimise coverage. The decline in service quality will get reflected in an increase in the number of dropped calls, patchy network coverage, as well as a reduced call completion rate.

4.5 *The business case for a new operator acquiring 900MHz spectrum at the proposed prices will not allow for expansion to rural markets to address these coverage gaps*

In the scenario of a new operator acquiring the refarmed 900MHz band, the overall business viability remains a question mark especially due to the high level of investment in acquiring the spectrum. We

estimate that for such a new operator the time for EBITDA breakeven will be as high as 10 years, as illustrated in Figure 4.2.

Figure 4.2: EBITDA breakeven for a 900MHz 3G operator in India [Source: Analysys Mason, 2012]

Parameter	Units	Value
All India capex (equipment and spectrum)	INR Cr	50 748
All India spectrum cost (2×5MHz)	INR Cr	36 222
Equipment capex for coverage / capacity[7]	INR Cr	14 526
Estimated wireless subscriber base (2020)[8]	Million	1520
Estimated subscriber base for a single operator on 900MHz[9]	Million	76
Capex per user	INR	6677
Expected monthly ARPU[10]	INR	176
Monthly EBITDA per user (@29.5%)[11]	INR	52
Time required for breakeven in months	**Months**	**129 months (more than 10 years)**

The business economics, as well as existing market scenario of muted data demand (especially in rural areas) suggests that the operator focus will be primarily concentrated in urban areas in the initial years. This will keep the coverage gaps in rural areas unfilled for a long time, with an impact on service continuity. Even the experience of new entrants on 1800MHz in India market suggests that the initial focus of service offerings has been urban and semi-urban areas, with rural areas being left out, presumably due to relatively poor economics.

4.6 *If the incremental investment in refarming and the costs of spectrum are passed on to consumers in the form of enhanced retail voice tariffs, the overall tariffs will go up by as much as 61 paise per minute, with a higher impact on tariffs in non-Metro circles*

In addition to connectivity and coverage issues, consumers will also face a steep increase in tariffs as a consequence of additional investments by operators in refarming. The pan-India impact of investments in spectrum has been estimated to be up to 34 paise per minute[12]. The additional impact of refarming

[7] Calculation based on average 107,600 sites required to meet the current level of pan India coverage / capacity as deployed by existing operators using the 900MHz spectrum band

[8] Analysys Mason estimate based on circle wise analysis

[9] Assuming 75% market share for existing operators and 25% for new 900MHz operators; new five 900MHz operators with 2×5MHz spectrum each, with an equal market share of 5%

[10] Based on current ARPU of leading operators

[11] Average EBITDA margin for leading private operators using 900MHz spectrum

[12] Impact of TRAI's spectrum recommendations on consumers and industry, COAI and PwC (May 2012)

will be as high as about 30 paise per minute as a result of increased capex and opex for replacing existing 900MHz sites with 1800MHz sites, deploying new 1800MHz sites for addressing coverage gaps. Figure 4.3 provides details on such an impact on tariffs by different category of circles.

Figure 4.3: Impact on cost per outgoing minute (INR) due to 900MHz spectrum refarming [Source: Analysys Mason, 2012]

Metric	Metro	Category A	Category B	Category C	Pan India
Increase in capex and opex cost per outgoing minute (INR)	0.21	0.29	0.34	0.28	**0.30**
Increase in spectrum cost per outgoing minute (INR)[13]	1.11	0.47	0.10	0.04	**0.34**
Total Increase in cost per outgoing minute (INR)	1.32	0.76	0.44	0.32	**0.64**

4.7 *If the cost of refarming is not passed on to consumers, then the EBITDA margins of operators with 900MHz spectrum holdings will decline by about 8%*

If the cost of refarming is not passed on to the consumers, incremental operational expenditure from additional sites will result in a decline of about 8% in EBITDA margins for operators with 900MHz holdings, as illustrated in Figure A-6 in Annex A.

Such a decline in profitability will only impact operators using 900MHz spectrum, and will skew the competitive parity in the market place with other operators. More importantly, the current scenario of liquidity crunch and high total debt (Total debt of about INR 185,720 crores as of FY12 with Debt to EBITDA ratio of 4.87[14]) burden faced by the industry is likely to further impact existing operators using 900MHz spectrum as they will not be able to invest in to 2G and 3G network expansion, as well as deployment of new technologies such as LTE.

4.8 *The installation of additional sites will increase diesel consumption and contribute to environmental pollution equivalent to that of an additional 4.5 million cars*

We estimate that the migration from 900 MHz to 1800 MHz will require a total of about 171,954 additional base stations to maintain the same coverage in rural areas. This would mean that 107,471 additional towers will be deployed pan India (assuming an average tenancy of 1.6 base stations per tower).

Since a majority of these additional sites will be in rural areas where availability of electricity is an issue, the diesel consumption at these sites will be high. Assuming an average consumption of 11,500

[13] Impact of TRAI's spectrum recommendations on consumers and industry, COAI and PwC (May 2012)

[14] Impact of TRAI's spectrum recommendations on consumers and industry, COAI and PwC (May 2012)

litres of diesel every year per tower, the additional towers will result in an additional diesel consumption of about 1.2 billion litres of diesel every year [please refer Figure A-5 in Annex A for detailed calculations and estimations].

Also, a telecom tower on an average requires 6 kWh to 8 kWh of energy per hour per tower, which will lead to an additional 2.7 billion kWh of electricity consumption per year. For every litre of diesel, about 2.48 kg of CO2 is emitted and for every kWh of electricity consumed, 0.84 Kg of CO2 is emitted. Thus, the additional 171,954 sites will result in an incremental 5.4 million tons of CO2 emitted per year. This is equivalent to CO2 emitted by about 4.5 million cars (petrol car with engine size of 1000cc and average running of 1000 Kms per month) in a year.

Also, if a new operator acquires pan India spectrum in the 900MHz band after refarming, it will have to deploy about 107,600 sites in order to provide same coverage as current operators using 900MHz spectrum. This will mean an additional deployment of towers, leading to an additional CO2 emission of almost 3.4 million tons per operator per year, as illustrated in Figure 4.4. If three new operators acquires pan India licence, then these operators will have a total carbon footprint of 10.2 million tons per year.

Figure 4.4: Additional CO2 emissions due to deployments by a new pan India operator in 900MHz [Source: Analysys Mason, 2012]

	Number of BTSs	No. of additional towers	Additional diesel	Additional electricity	Additional CO2 emissions
	Nos.	*Nos.*	*Million Litres*	*Million kWh*	*'000 tons*
New operator	107 600	67 250	773	1718	3361

In addition, this migration will generate a huge amount of e-waste as the existing equipment will need to be discarded. Since such e-waste is not bio-degradable, disposing them off without further polluting the environment will add to existing issues, and cost.

5 Practice followed by other regulators

5.1 *International regulators follow a much more rigorous consultation process for refarming, accounting for key near term and long term issues for consumers and industry*

The TRAI consultation and recommendations lack the rigour, and comprehensive review of potential impact on consumers and industry considered by regulators in global markets while considering critical issues such as refarming of spectrum.

Some of the key questions which have been considered by almost all these regulators, and should have been considered for India as well include the following:

Consumers

- Will consumers have access to same level of coverage and service quality after refarming?
- Will there be an increase in tariffs due to the additional investments required?
- Will there be continuity of GSM services for existing users?
- Will the consumers be able to bear the cost of new technologies (handsets, data pricing)?

Technology maturity

- Is there a reasonably mature ecosystem for new technologies?
- Is there demand for new technologies such as UMTS / LTE?
- Will refarming of spectrum result in a faster adoption of new technologies?

Operators

- Will there be a business case for existing operators to continue services?
- What will be the increased investment for operators to maintain equivalent coverage?
- How many existing sites will be affected and how many new sites will have to be built?

Economic outcomes

- What will be the impact on teledensity?
- What will be the impact on rural coverage?
- What will be the impact on overall economy, if the coverage is reduced and the connected become unconnected?

Spectrum pricing and auctions

- Will revenues from spectrum auction be higher than licence extension?
- If auctioned, what should be the basis of determining auction price?

Competition

- Is there competitive parity amongst existing holders of licences across spectrum bands?
- Are there new entrants looking to get spectrum in a particular frequency band?

Figure 5.1 provides an overall summary of issues considered by regulators across markets where 900MHz refarming and spectrum management has been undertaken, or is being considered.

Figure 5.1: Factors analysed by regulators during the consultation process for spectrum management [Source: Analysys Mason]

Criteria	Australia	Austria	Denmark	France	Ireland	Italy	Malaysia	Sri Lanka	Sweden	UK	India
Safeguard consumers interest											
• *Will the consumers be able to get the same service coverage and QoS after refarming*	✓		✓				✓		✓	✓	
Forced churn of consumers											
• *Will GSM services be continued for existing users*	✓		✓	✓	✓				✓	✓	
Cost of spectrum release for existing users of spectrum											
• *What will be the impact on investment and business case viability for existing operators to maintain same service and coverage levels*					✓	✓		✓		✓	
Legal certainty											
• *Will renewal create an environment for increased investment compared to reallocation*	✓	✓			✓				✓		
Security of investment											
• *Is the licence period long enough for investment*	✓	✓	✓		✓			✓	✓		
Highest value use of spectrum											
• *Is there demand for new technologies such as UMTS / LTE*	✓	✓	✓	✓	✓	✓	✓		✓	✓	
• *Is there a reasonably mature ecosystem for such technologies*				✓	✓						
• *Will the consumers be able to bear the cost of new technologies (handset, data pricing)*					✓						
Realizing spectrum value											
• *Will revenues from spectrum auction be higher than licence renewal*	✓	✓									✓
• *If auctioned, what should be the basis of determining auction price*	✓	✓									✓
Competitive parity											
• *Is there competitive parity amongst existing holders of licences across spectrum bands*	✓	✓	✓	✓	✓	✓	✓	✓	✓		
• *Are there new entrants looking to get spectrum in a particular frequency band*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Societal welfare											
• *Will refarming of spectrum help in faster adoption of new technologies*	✓					✓	✓		✓	✓	
• *Will refarming adversely impact the environment*	✓					✓				✓	

5.2 *Regulators have made sure that the stakeholder issues are addressed in a fair and objective manner, even if it requires a multi-year consultation process to do so*

In the case of UK, Ofcom started the consultation process on liberalisation of 900MHz and 1800MHz band in September 2007. In February 2009, it initiated the second consultation process focussing on the future of the spectrum currently used to provide 2G and 3G mobile services in the UK. Finally, in January 2011, it decided to liberalise the 900MHz spectrum in hands of incumbents without any change in quantum of spectrum holding.

In Ireland, the national regulatory authority, ComReg, carried out an extensive consultation process which went on for almost four years, from July 2008 to Mar 2012, before finalising its decision on the process of liberalisation, as illustrated in Figure 5.2.

Figure 5.2: 900MHz and 1800MHz spectrum liberalisation consultation process followed by ComReg, the Ireland NRA [Source: ComReg]

Consultation date	Description
17 July 2008	• Liberalising the use of the 900 MHz and 1800 MHz spectrum bands
10 March 2009	• Liberalising the future use of the 900 MHz and 1800 MHz spectrum bands and spectrum release options
21 December 2009	• Response to consultation and further consultation on liberalising the future use of the 900 MHz and 1800 MHz bands
17 September 2010	• Consultation paper on 800MHz, 900 MHz & 1800 MHz spectrum release - On the inclusion of the 800 MHz band in the 900 MHz award process
15 December 2010	• Consultation paper on inclusion of the 1800 MHz band into the proposed joint award of 800 MHz and 900 MHz spectrum
24 August 2011	• Response to Consultation and Draft Decision on a Multi-band spectrum release - Presenting ComReg's comprehensive proposals as well as a draft decision supported by a draft regulatory impact assessment
24 October 2011	• Draft Information memorandum on Multi-band Spectrum Release - a draft information memorandum which details the processes and procedures ComReg envisages it will employ if it were to implement its proposals as detailed in draft decision on a multi-band spectrum release (24 August 2011)
16 March 2012	• Release of the 800 MHz, 900 MHz and 1800 MHz Radio Spectrum Bands - Response to Consultation and Final Decision

We believe that a detailed and focused consultation process which takes into consideration the impact of refarming on consumers, operators as well as environment will be imperative to demonstrate credibility of the refarming process.

5.3 *Full withdrawal of spectrum resulting in the shutdown of existing operational networks is unprecedented. Partial withdrawal has generally happened to allow entry for new operators, but has impacted only a marginal portion of the overall spectrum holdings*

We have not come across any refarming situation globally where a specific band of spectrum (especially 900MHz) has been fully withdrawn for refarming. Partial withdrawal has generally happened to allow entry for new operators, but has impacted only a marginal portion of the overall spectrum holdings.

In all the cases the withdrawal of spectrum from incumbents has been partial (mostly 2×2.5MHz of the total spectrum holding of the operator in the 900MHz band), and has formed a very small share of the total spectrum holdings of existing operators, as illustrated in Figure 5.3. In these markets, incumbent operators had a lot of spectrum in multiple bands (such as 900MHz, 1800MHz, 1900MHz, 2100MHz and 2600MHz) and withdrawal of a small part of the spectrum will not impact their on-going operations substantially. Even in these markets, the regulator carried out the withdrawal activity through collaborative discussions with service providers.

Figure 5.3: 900MHz spectrum redistribution across select markets [Source: Analysys Mason, 2012]

Market	Operator	900MHz refarming (MHz)		Spectrum holdings in other key bands (MHz)			
		Before	**After**	**1800**	**1900**	**2100**	**2600**
Sweden	Tele2	2×10	2×7.5	2×3	5[15]	2×19.8	2×20
	TeliaSonera	2×10	2×10	2×3			2×20
	Telenor	2×10	2×7.5	2×3	5	2×19.8	2×20
	Swefour	2×5	2×5	-	-	-	-
	Hi3G	-	2×5	-	5	2×19.8	2×10/20
France	Bouygues Telecom	2×9.8	2×9.8	2×26.6(21.6)	5	2×14.6	-
	Orange France	2×12.4	2×10	2×23.8	5	2×19.6	-
	SFR	2×12.4	2×10	2×23.8	5	2×9.8	-
	Free Mobile	-	2×5	-	-	2×5	-
Denmark	Telia	2×14.8	2×11.8	2×23.6	5	2×15	2×20/15
	TDC Mobil	2×9	2×9	2×17.2	5	2×15	2×20
	Telenor	2×9	2×9	2×20.2	5	2×15	2×20/10
	Hi3G	-	2×5	2×10	5	2×15	2×10/25

[15]Represents spectrum holding by Svenska, a company owned by Tele2 and TeliaSonera

More importantly, in these markets, incumbent operators with 900MHz spectrum are still using the spectrum for GSM services rather than UMTS. As of February 2012, only Hi3G (Sweden), Orange (France) and SRF (France) have launched UMTS services in 900MHz.[16] Also, in these markets, the 900MHz band includes the EGSM spectrum of 10MHz+10MHz, which has been given to some operators in India that have used it to deploy CDMA services.

In summary, partial withdrawal of spectrum for competitive entry has been the primary approach to refarming, with adequate mechanisms in place to ensure that operators have sufficient spectrum across bands to provide services across technologies.

5.4 *Implementation of the current recommendations on refarming will have an enormous operational element which has not been given sufficient consideration*

Also, the recommendations have completely ignored the on-the-ground operational process required for migration of two live networks simultaneously from one frequency band to another, while maintain customer connectivity. The key elements which have been ignored include:

- *Spectrum availability* – For the period of migration, operators will need access to both the spectrum bands (900MHz and 1800MHz) to ensure that customers do not get disconnected from their service. The recommendations do not consider such a scenario and appear to have adopted more of an academic approach rather than an on-the-ground analysis to actually understand the impact of these recommendations

- *Interference issues* – The migration of 800MHz network to 1900MHz band will lead to interference with the existing 2100MHz 3G operations as this band is adjacent to the uplink band on the exiting 2100MHz 3G network. The interference issues, if not resolved, will make the refarming of 800MHz impractical. This might lead to disparity among operators as 900MHz refarming, if it happens, will be carried out in next few years (at least for two operators across circles) while the refarming of 800MHz spectrum may not become possible as a result of interference.

All the above operational issues need to be given sufficient consideration during the consultation process as well as while developing the recommendations along with key stakeholders' participation at all the steps of the process.

[16] GSA UMTS status report dated February 9, 2012

6 Impact of refarming on value of spectrum

TRAI believes that refarming of spectrum in the 900MHz band will allow for more efficient use of spectrum and ultimately result in higher revenues for operators through deployment of new technologies. This is a theoretical argument as current market conditions in India suggest that the incremental economic value of this so-called liberalised spectrum may be limited due to a range of factors such as potential demand for wireless data services in the near future, and the maturity of the device ecosystem.

6.1 *The so-called liberalised 1800MHz spectrum will have to deployed to support existing voice users, with limited data revenue potential due to ecosystem maturity issues*

Operators using 900MHz spectrum currently support 456 million users (51% of the total mobile user base) on their networks. If the proposed recommendations are implemented and this user base is migrated to 1800MHz, operators will still need to have access to GSM based voice services. Even in global markets, the expectation is that GSM (on 900MHz) will at least continue up to the year 2020, and will remain the predominant technology for carrying voice. For India, given the voice-centric nature of the market, we expect that GSM based services will continue up to the year 2025.

Also all the proposed new technologies (UMTS, LTE) to be deployed on the so-called liberalised spectrum need at least 2×5MHz of spectrum. For markets such as Mumbai and Delhi, running voice services in addition to deployment of data technologies is virtually impossible without a significant degradation in quality of service. The availability of such limited spectrum coupled with the need to support voice users makes the liberalisation argument academic.

Also, the market for data services is still immature in India and likely to be adequately served by 3G in 2100 MHz for the foreseeable future. The demand for data remains been limited due to the high prices of devices and services, and most importantly the lack of relevant content, applications and use cases. If we consider the current state of 3G service offerings in the 2100MHz band, industry inputs indicate that only 4 to 5% of the overall mobile user base has a 3G-enabled phone, and the adoption of 3G services remains limited. With the right market enablers, this adoption will grow over years, but as of today, data services remain a small part of operators' overall business even on a mature technology and device ecosystem such as 2100UMTS.

Compared to 2100UMTS, the 1800LTE technology and device ecosystem remains relatively immature, especially for providing data services in emerging markets. Also, the lack of voice support on LTE necessitates the deployment of GSM on 1800MHz, or else creates dependence of additional coverage layer for providing voice support. This means that the so-called liberalised 1800MHz spectrum will continue to be primarily used for providing voice services using GSM technology, and the objective of

absolute revenue enhancement from increased penetration of data services will not be realised in the near foreseeable future.

The lack of such an upside from data, and the requirement to carry GSM based voice services for existing users completely defeats the objective of the so-called liberalisation of spectrum through refarming.

6.2 *Despite a lack of incremental upside from so-called liberalised spectrum, the price of spectrum been set at a substantially high level*

Although the revenue upside from the liberalisation of 1800MHz spectrum is uncertain, the reserve price for this band has been set at a substantially high level in comparison with international benchmarks (as illustrated in Figure 6.1). Such a high price will also have a cascading impact on the prices of spectrum in the 900MHz and 700MHz bands.

Figure 6.1: Prices for 1800MHz spectrum (PPP) across countries [Source: Analysys Mason, 2012]

Market	Year	Duration (years)	Allocation process	Reserve price (USD/MHz/Pop)
Bulgaria	Dec-11	10	Beauty contest	–
Portugal	Nov-11	–	Auction	0.05
Sweden	Oct-11	25	Auction	0.01
Italy	Sep-11	17	Auction	0.07
South Korea	Aug-11	–	Auction	0.57
Germany	May-10	15	Auction	0.004
India Metros (proposed)	**2012**	**20**	**Auction**	**10.32 to 10.94**
India Cat A Circles (proposed)	**2012**	**20**	**Auction**	**0.72 to 1.49**

Given this market and economic context, it is possible that none of the Indian operators bids for 1800MHz spectrum given its high reserve price. In some cases, operators may not have any other alternatives but to get access to the 1800MHz spectrum block to continue their operations. This mainly applies to new operators whose licences have been cancelled after they have made significant investments in capital expenditure (capex) and market development. More importantly, these new operators are experiencing substantial EBITDA losses[17] even after four years of operation, and given this scenario, the higher economic value of spectrum will not encourage these operators to participate in

[17] Uninor reported an EBITDA loss of USD 571 mn in 2011, source: Telenor reported data

the auction process. In summary, the spectrum price will in effect become an administered price rather than a price discovered by the market participants in a free and non-coercive fashion.

Also, for operators that have already invested substantial capex in acquiring 2100MHz spectrum and rolling out networks, the utility of the liberalised 900MHz spectrum will be limited.

TRAI's recommendations also create an uncertainty about the future auctions of spectrum in the 900MHz band. The reserve price for 1800MHz spectrum is very high. If such a price is applied to licence extensions, and if licensees further incur an exorbitant cost to set up additional sites and migrate to 1800MHz due to refarming, then the purchasing capacity of such operators for later auctions will be significantly impacted. If the licences have an extension clause, then it would be right to presume that the continuity of spectrum, which is an underlying feature of the established networks and the agreements, should also be given in the extension of the licence. In summary, such a withdrawal of 900MHz spectrum does not appear to be in the overall economic interest.

6.3 *Given the limited holdings, the practicalities of clearing spectrum need to be considered*

Operators have limited holdings of spectrum and if 900MHz spectrum is refarmed, then they will be left with very little spectrum in which to accommodate the entire volume of voice traffic. Further since new technologies such as UMTS and LTE require a minimum of 5MHz spectrum, the quantum of spectrum left for GSM to carry voice would be minuscule.

6.4 *Anecdotal evidence suggests that there already exists a technology neutral environment in India*

The existing licences are technology neutral. Given that the underlying spectrum was assigned as part of the licence, it may be concluded that the allocated spectrum can be used by operators to deploy any technology of their choice.

An evaluation of various documentation and responses by the Department of Telecommunications also supports this position. Further, market evidence of some operators using the 800MHz spectrum in a liberalised fashion to provide EVDO-based data services also suggests that the technology environment in India remains liberalised.

As per the letter issued by the Department of Telecommunications on 13 September 1999[18], "*all new Cellular Mobile Service Providers will be technology neutral; however, the technology must be digital. The existing licensees of cellular services on their migration to the NTP-99 regime in terms of migration package already offered to them, will also be permitted to expand their networks using any other technology or the GSM technology to which they have been bound so far as per the existing licences.*"

[18] F.No.842-304/99-VAS

This is further supported by Department of Telecommunications' responses to queries regarding technology neutrality raised by operators during the 3G and broadband wireless access (BWA) spectrum auctions, as shown below in Figure 6.2.

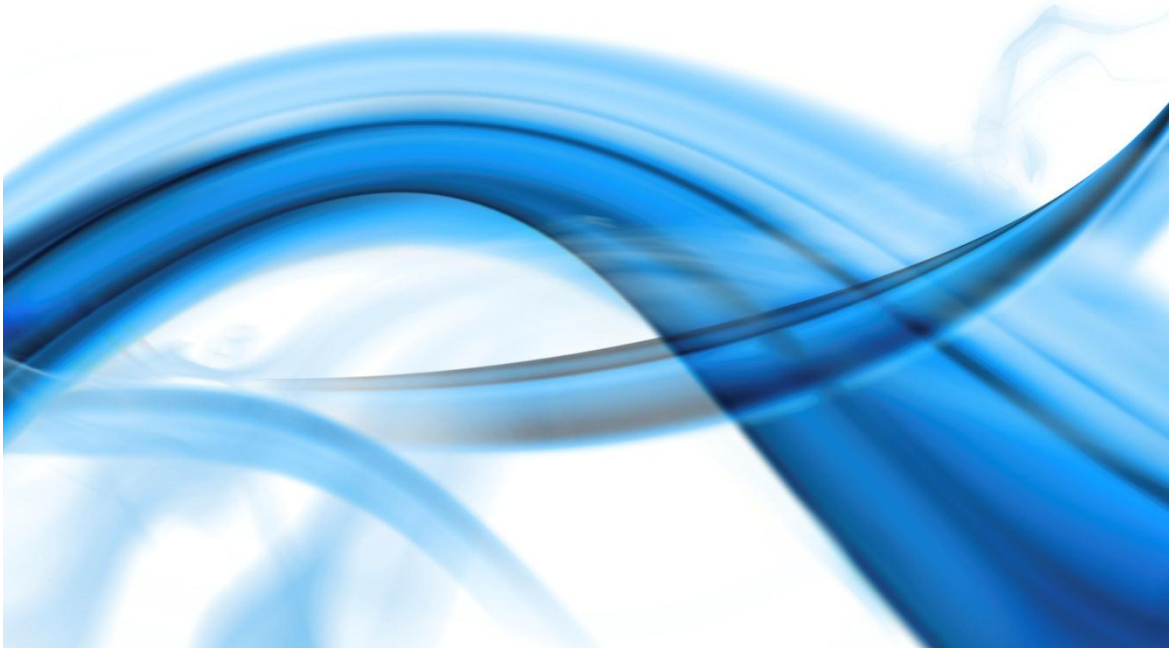
Figure 6.2: Responses by the Department of Telecommunications to queries raised during the 3G and BWA spectrum auctions in 2010 [Source: Department of Telecommunications]

Query	Department of Telecommunications' response
Please confirm whether 3G services can be rolled out in 2G spectrum assignments? (Q188, Page 45)	Provision of services is governed by the licence held by the service provider. The current auctions are for spectrum, not licences
In light of the policy of technology neutrality and Unified Access Service licences, are there any restrictions whatsoever on the use of the 800 /900 /1800 /2100 /2300 MHz, or any other spectrum band, for providing access services? (Q274, Page 64)	The permissible usage is governed by the provisions of the respective service licences

7 Conclusions and next steps

It can broadly be concluded that the current recommendations and the preceding consultation on spectrum refarming lack the rigour and considered thought required for addressing issues with such significant implications. Implementing these recommendations in their current form will not be beneficial for the consumers, the environment, as well the business viability of operators. In summary, the proposed refarming will have a substantial cost to the industry, increase retail tariffs and cause significant inconvenience to consumers as also adversely impact the environment, with no benefit to any stakeholder.

We believe that given the above regulatory context, and the clear gaps in the consultation approach adopted to develop the current recommendations, it is imperative to have a dedicated and detailed consultation process for spectrum refarming at the earliest. Such a consultation paper should include rationale for such refarming, regulatory impact assessment on consumers, the environment and industry participants, operational considerations, and provide a fair chance for operators to present their views and perspectives.



Annex A Key assumptions and modelling results

Figure A.1: Number of additional and replacement sites for maintaining same level of coverage using 1800MHz sites in urban areas [Source: Analysys Mason]

Circle category	BTS for replacement from 900MHz	Additional 1800MHz BTS
Metros	23285	13971
Category A	37780	22668
Category B	24806	14884
Category C	8799	5280
Total sites	**94 670**	**56802**

Key Assumptions:

- Urban BTSs have been estimated based on assumption of 100% geographical coverage
- BTS radius assumptions for urban sites on 900 MHz: 1.50 Kms radius for urban areas and 0.6 Kms radius for dense urban areas
- Additional sites has been calculated using the coverage factor of 1.6x for 1800MHz

Figure A.2: Number of additional and replacement sites for maintaining same level of coverage using 1800MHz sites in rural areas [Source: Analysys Mason]

Circle category	BTS for replacement from 900MHz	Additional 1800MHz BTS
Metros	-	-
Category A	66789	40073
Category B	92257	55354
Category C	32874	19725
Total sites	**191920**	**115152**

Key Assumptions:

- Rural sites have been calculated based on circle wise total number of BTS by operator minus urban sites estimated in Figure A.1
- Additional sites has been calculated using the coverage factor of 1.6x for 1800MHz

Figure A.3: Additional capex required by operators using 900MHz spectrum for migration to1800MHz – all figures in INR crores [Source: Analysys Mason, TRAI]

Circle category	1800MHz migration capex[19] in urban areas	1800MHz migration capex in rural areas	Total incremental capex
Metros	-	4447	4447
Category A	12757	7216	19973
Category B	17 621	4738	22 359
Category C	6279	1681	7960
Total	**36657**	**18082**	**54739**

Key Assumptions:

- Estimated based on average per site capex for a configuration of 4-4-4
  - Additional site: Per site capex of INR 13.5 lacs (includes cost of BTS, antennas/RF, microwave link and labour/service charges)
  - Replacement site: Per site capex of INR 11.0lacs (includes cost of BTS, antennas and labour/service charges)

Figure A.4: Additional opex and capex per year required by operators using 900MHz spectrum for migration to1800MHz – all figures in INR crores [Source: Analysys Mason, TRAI]

Circle category	Incremental capex (amortized)	Annual incremental opex[20]	Reduction in spectrum usage charge	Total incremental annual cost
Metros	855	956	(162)	1649
Category A	3839	4291	(487)	7643
Category B	4297	4804	(374)	8727
Category C	1530	1710	(136)	3104
Total	**10521**	**11 762**	**(1159)**	**21 123**

[19]Cumulative Capex for migration to 1800MHz

[20]Additional annual opex due to increased number of sites in rural areas as a result of migration to 1800MHz

Key Assumptions:

- Incremental capex has been depreciated linearly assuming a life time of 9 years, and cost of capital at 12.63% (average SBI PLR as mentioned in TRAI recommendations on auction of spectrum)
- Incremental annual opex is estimated based on monthly opex per site of INR 57,000 (including tower rental, electricity/diesel, security and other costs)
- Reduction on spectrum usage charge is calculated based on circle wise spectrum usage charge contributed by operators using 900MHz spectrum (5.9% to 5.4% across different circle categories) as reported by TRAI on a quarterly basis (QE December 2011) minus new proposed spectrum charges (3%)

Figure A.5: Additional CO2 emission due to increase in number of sites [Source: Analysys Mason]

Circle Category	Number of additional BTS	No. of additional towers	Additional diesel	Additional electricity	Additional CO2 emissions
	Nos.	*Nos.*	*Million Litres*	*Million kWh*	*'000 tons*
Metros	13 971	8 732	100	223	436
Category A	62 741	39 213	451	1002	1960
Category B	70 238	43 899	505	1122	2194
Category C	25 004	15 628	180	399	781
Total	**171 954**	**107 471**	**1236**	**2746**	**5371**

Key Assumptions:

- Number of additional towers has been calculated assuming an average tenancy of 1.6
- Additional diesel consumption has been estimated based on an average diesel generator usage of 10.5 hours per day consuming 3 litres per hour (about 11,500 litres per tower per annum)
- Additional CO2 emissions have been calculated
  - CO2 emission of 2.48 kg for every litre of diesel
  - CO2 emission of 0.84 kg for every kWh of electricity consumed

Figure A.6: EBITDA margin impact on operators using 900MHz spectrum due to refarming [Source: Analysys Mason]

Parameter	Units	Value
Combined FY 2012 revenues of leading GSM operators	INR Cr	95 207
Combined opex of leading operators	INR Cr	67 144
Combined EBITDA margin of these operators	INR Cr	28 063
Combined EBITDA margin of these operators	%	29.5%
Additional opex due to refarming	INR Cr	7671
Revised EBITDA after refarming	INR Cr	20392
Revised EBITDA margin after refarming	**%**	**21.4%**

Key Assumptions:

- Calculated using reported financials of Bharti Airtel, Idea Cellular and Vodafone

Contacts

Pankaj Agrawal
Co-Head, Analysys Mason India

pankaj.agrawal@analysysmason.com
+91.995.890.1085

Cambridge
Tel: +44 (0)845 600 5244
Fax: +44 (0)1223 460866
cambridge@analysysmason.com

Dubai
Tel: +971 (0)4 446 7473
Fax: +971 (0)4 446 9827
dubai@analysysmason.com

Dublin
Tel: +353 (0)1 602 4755
Fax: +353 (0)1 602 4777
dublin@analysysmason.com

Edinburgh
Tel: +44 (0)845 600 5244
Fax: +44 (0)131 443 9944
edinburgh@analysysmason.com

London
Tel: +44 (0)845 600 5244
Fax: +44 (0)20 7395 9001
london@analysysmason.com

Madrid
Tel: +34 91 399 5016
Fax: +34 91 451 8071
madrid@analysysmason.com

Manchester
Tel: +44 (0)845 600 5244
Fax: +44 (0)161 877 7810
manchester@analysysmason.com

Milan
Tel: +39 02 76 31 88 34
Fax: +39 02 36 50 45 50
milan@analysysmason.com

New Delhi
Tel: +91 11 4700 3100
Fax: +91 11 4700 3102
newdelhi@analysysmason.com

Paris
Tel: +33 (0)1 72 71 96 96
Fax: +33 (0)1 72 71 96 97
paris@analysysmason.com

Singapore
Tel: +65 6493 6038
Fax: +65 6720 6038
singapore@analysysmason.com

Washington DC
Tel: +1 202 331 3080
Fax: +1 202 331 3083
washingtondc@analysysmason.com

Ref: 34817-222

Request Your Most Urgent Kind Attention, Please

5 August 2014

Without Prejudice

Dr. Rahul Khullar
Chairman
Telecom Regulatory Authority of India
Mahanagar Doorsanchar Bhawan,
Jawahar Lal Nehru Marg, Old Minto Road,
New Delhi - 110 002

Dear Sir,

'Forthcoming Spectrum Auctions Designed to Promote Unfair Competition'

We respectfully draw the attention of the Authority to the **proposed design for the forthcoming Spectrum Auctions,** which, we humbly submit, **will aid and promote predatory competition** and will be in contravention of Telecom Policy and Competition Law.

As the Authority is aware, **for the February 2014 Spectrum Auctions, the DoT had put to auction the entire 900 MHz and 1800 MHz** spectrum holdings of such Licensees whose Initial Period of License was coming to an end, and ought to have been extended as per Clause 4.1 of their respective licenses.

That said, the **DoT had however, additionally and simultaneously, put to auction further/adequate quantities** of 1800 MHz spectrum. Therefore, the February 2014 Auctions had three possible outcomes for the Extension Licensees:

a. Retain the current spectrum mix, but at an exaggerated cost, OR
b. Acquire a changed mix of spectrum and avert business closure, but suffer network disruption, jeopardize continuity and quality of service to existing customers, lay waste investments, etc, OR
c. Business closure.

But now, for the forthcoming Spectrum Auction, the **DoT while still proceeding to place on auction the entire 900 MHz and 1800 MHz spectrum holdings** of Licensees whose Initial Period is ending in 2015-16, **has no plans to additionally and simultaneously put to auction further quantity** of spectrum that would allow the licensee to acquire even a changed mix of spectrum and avert business closure.

#

It is submitted that the **proposed Auction design is inherently anti-competitive, as it aids and promotes Predatory and Unfair Competition** by its very design and **is not in consonance with Telecom Policy and Competition Law,** for reasons set out below:

a. **Predatory Competition** is a phenomenon **whereby the Predator Organisation *seemingly* promotes** competition, **while *actually* preying on a Competing Organisation**, **leading eventually to the reduction of Competition**.

b. This **Proposed Auction is designed to inescapably lead to stark Predatory Competition** as **every Licensee whose license is NOT coming up for extension in the Circle concerned, can act like a Predator**. **Such predators can bid for amounts far in excess of any genuine value** that they ascribe to the spectrum, secure in the knowledge that such predatory bidding can only result in:

- *Either* the Existing Spectrum Holder making the Winning Bid, but getting financially strangled and competitively debilitated in the process.
- *Or* the Predator Bidder makes the Winning Bid, and bags not just the spectrum but also drives a major competitor out of business.

c. It is thus respectfully submitted that the **proposed auction is not designed to increase competition, but rather designed to reduce competition**! **Should a non-incumbent bidder make a winning bid, he will not be enhancing market competition**. Instead, his entry would **necessarily herald a sharp reduction in competition with the business closure of a major competitor,** not to talk of the **millions of customers who will be affected by such a disruptive result.**

We hasten to clarify that we fully endorse auctions and competition, and would like the forthcoming auction to be concluded at the earliest. We do however **believe that it is in the national interest to place adequate spectrum to auction**, and it is **eminently possible to conduct an auction that is:**

- **Consistent with meeting extension obligations and retaining/restoring investor trust**,
- **Without undue volatility in spectrum prices** from previous auctions and also,
- **Fetching even greater revenues to the exchequer** and
- **fuelling economic activity.**

We would be pleased to place our suggestions in this regard before the Authority.

We would also like to **draw the kind attention of the Authority to the objectives under Telecom Policy and under the TRAI Act**, viz. nurturing the growth of the sector and providing a fair and transparent policy environment which promotes a level playing field and facilitates fair competition.

We **ask the Authority to examine and clarify whether the proposed auction design is consistent or inconsistent with the stated objectives of *fair competition and sector growth*.**

As the matter is of great importance, and not a day's delay in the auction schedule is desirable, **we request your most urgent kind attention and early response to our above submissions.**

Kind regards,

Sincerely yours,

Gopal Vittal **MD & CEO, India & South Asia** **Bharti Airtel**	**Himanshu Kapania** **Managing Director** **Idea Cellular**	**Marten Pieters** **MD & CEO** **Vodafone India**

Copy to : Shri R. K. Arnold, Member, TRAI
: Dr. Vijayalakshmy K. Gupta, Member, TRAI
: Shri Sudhir Gupta, Secretary, TRAI

#

Cellular Operators Association of India

RSM/COAI/2013/168
September 19, 2013

Shri. M. F. Farooqui
Secretary
Department of Telecommunications
Sanchar Bhawan, 20 Ashoka Road
New Delhi - 110001

Dear Sir,

Subject: Spectrum Related Issues

1. We thank you and the Hon'ble MoC&IT for holding an Open House on September 11, 2013 to hear the concerns of industry and articulate a way forward for the industry from its present stagnant state. In this context, we submit the following spectrum related issues for your kind consideration, which were raised during the Open House discussion:

   a) **Government should define the roadmap, including quantum, broad timelines for availability and tentative auction time for all the bands of spectrum including 700/800/900/1800/2100/2300/2500-2690 MHz, before any auction is conducted.**

   b) **Government should accept TRAI recommendation on E-GSM and auction the E-GSM band.**

   c) **Government should once again review the proposal of Refarming of entire 900 MHz in a holistic manner considering the continuity of services for subscribers as well as operators.**

   d) **Government should accept our proposal of sharing of 300 MHz band in the 1700-2000 MHz band with Ministry of Defence to facilitate unlocking of potential of 3G band.**

2. The details of our above submissions are given below:

   a) **Spectrum Roadmap**

      i. We request the Government to define the roadmap, including quantum, broad timelines for availability and tentative auction time for all the bands of spectrum including 700/800/900/1800/2100/2300/2500-2690 MHz.

   b) **E-GSM Band**

      i. The TRAI has recommended the feasibility of adoption of E-GSM band.

      ii. We believe that given the declining numbers of CDMA users (28% year -on-year), the shrinking minutes of use (an average decline of 10% year-on-year over the past three years), the lack of interest in acquiring CDMA spectrum (nearly 70% unsold), the apparent desire by one operator to surrender spectrum and the greater interest in 900MHz, there is a strong

14, Bhai Veer Singh Marg, New Delhi - 110 001
Tel. : +91-11-23349275 Fax : +91-11-23349276/77 E-Mail : contact@coai.in • Website : www.coai.in

case to reconfigure the 800MHz band plan, auction the released spectrum as E-GSM, and harmonize India with the majority of Europe, the Middle East and Africa and the Asia Pacific region. 880-915 and 925-960 MHz (35+35 MHz as compared to existing 25+25 MHz), is globally considered as a part of 900MHz band and will enhance the 900 MHz band from present 25 MHz to 35 MHz. This is especially important as the present recommendations of TRAI provide no pathway for growth and expansion for holders of 900 MHz spectrum.

iii. Vide a letter by our members Airtel, Idea and Vodafone dated November 22, 2012 and our letter no. RSM/COAI/2013/106 dated May 31, 2013, we had already submitted the details of allocation of spectrum to CDMA operators in the lower band to free 880-890 MHz for E-GSM.

iv. For the downlink band of 925-935 MHz, we believe that the captive users would be using it either for point to point or point to multipoint connectivity with at most one transceiver. Regarding the 7 MHz being used by Defence, they might not be using it for cellular networks or any network having pan India presences and would be using it only in some confined areas. In case, it is not possible to shift these assignments, then the Government may choose to exclude these spots from the auction. Such practice is even adopted in other frequency bands such as 1800 MHz/2100 MHz where the spectrum assigned is not available in some of the areas of LSA.

v. We thus suggest that E-GSM band should also be auctioned. It is also important to note that auction of the E-GSM spectrum as 900 MHz band will meet the following national objectives:

a. It will lead to more efficient utilization of spectrum.
b. Ensure availability of more spectrum in the 900 MHz band to cater to increased demand for this resource.
c. It will provide an opportunity to interested TSPs to acquire the sub 1 GHz band spectrum.
d. Contribute to enhancing investor interest and attract investments in the sector.

c) <u>Continuity of Service in 900 MHz Band</u>

i. Please refer to our letter no. RSM/COAI/2013/106 dated May 31, 2013 vide which we had already raised our concerns regarding Refarming of 900 MHz band and continuity of service to the subscribers being served by the operators in this band.

ii. We would like to reiterate that the term "Refarming" as used by DoT and as suggested by some stakeholders is a complete misnomer and out of line with international practices as already brought out in our response to the consultation. Nowhere has the entire spectrum been withdrawn for Refarming. In other countries, where limited refarming has taken place, the operators had far higher allocations of spectrum than India and there has only been partial withdrawal leaving behind a significant quantum of spectrum with existing TSPs.

iii. Under NTP-99, licenses are for a term of 20 years, with the express provision of extension by 10 year periods thereafter. As per clause 4.1 of the UAS/CMTS License extension is to be on mutually agreed terms. Needless to say, such extension is both expedient and in the public interest.

iv. It is also submitted that these licenses have been allocated through a competitive bidding process and are bundled with spectrum. It is, therefore, evident that the extension of the existing licenses on expiry of initial term would also include the corresponding extension of the bundled spectrum allocated to the licensee in both the 900 MHz/1800 MHz band.

v. Withdrawal of any portion of the presently assigned spectrum in the 900 MHz band from the existing TSPs will result in major coverage gaps, quality of service issues and more importantly, inconvenience to the existing subscribers served in these bands. Re-planning of the network will mean unwarranted wastage of existing investments and added capex and opex in new infrastructure, which is neither in national nor the public interest. The associated techno-economic issues have been provided in our submission, which, we are confident that the TRAI has considered in its entirety.

vi. Also, without prejudice to our contention that there is no such thing as a prescribed limit under license, these stakeholders ignore that the Government has already communicated its decision in its Press Release dated 15 February 2012 that existing licenses will be extended along with spectrum upto the prescribed limit. This decision does not at all indicate any variation in the spectrum bands, but only refers to a limit on the quantum of spectrum.

vii. We thus request DoT to once again consider our submissions on 900 MHz Refarming issues and review the entire issue in a holistic manner.

d) <u>Unlocking 3G Spectrum Availability</u>

i. Vide our letter No. RSM/COAI/2013/031 dated February 15, 2013, we had suggested a more realistic sharing of 300 MHz in the 1700-2000 MHz band so that it becomes useful for all the stakeholders including Defence and the Indian telecom. We have suggested the following as DoT's revised usage for its 150 MHz share:

   a. 2x55 (110) MHz for GSM 1800 MHz band
   b. 40 MHz for 3G HSPA in 2100 MHz band (of which 20 MHz has already been auctioned)

ii. The proposed solution will give DoT additional bonus of leveraging an additional 15MHz of the 3G band, which falls in the downlink 2110-2170 MHz and is beyond the scope of sharing agreement.

iii. The MoD should have no objection to this scheme since the DoT's demand for 15 MHz in lieu of 2x7.5 MHz of the US PCS band will keep undisturbed the150 MHz cap agreed between them. The OFC network currently being executed for the MoD will be ready long before the CDMA licenses fall due for extension in next 10 years. This will enable the MoD to release additional spectrum for refarming of 800 MHz band, if at all this is ever needed.

iv. However, some recent media reports state DoT is concerned over this proposal and feel that it will hamper the growth path for CDMA operators. In this regard, we would like to submit that the TRAI in its recent recommendations has recommended no reservation of any spectrum band. Holding 15 MHz of spectrum in 1900 MHz band for CDMA players will tantamount to hording and wastage of precious spectrum and loss of immediate revenue opportunity for Government, as most of 800 MHz licenses will come up for renewal only in 2022.

v. As has already been stated that there is diminishing interest of operators in the CDMA technology and the subscriber base is constantly decreasing, hence, the current allocations are enough to cater to the subscribers. Moreover, CDMA players have already deployed EVDO technology in 800 MHz band and hence they do not need 1900 MHz band for providing high data speed services.

vi. It is also pertinent to note that the usage of 1900 MHz band by existing CDMA players is not practically possible, as the CDMA handsets for 800 MHz band are not compatible with the 1900 MHz band. The existing CDMA subscribers will need to buy new handsets in case they are migrated to 1900 MHz band.

vii. Moreover, in case 1900 MHz band is put to use as presently held, it will lead to suboptimal usage due to the need for additional guard band required for preventing interference due to coexistence of adjacent 2100 MHz band.

viii. Our nation is broadband starved and the proposed step by COAI is a win-win for every stakeholder and for every Indian. India is literally at the broadband crossroad. The right direction will provide immeasurable societal benefits for decades. Equally, the wrong turn will cause incalculable damage.

We hope our above submissions will merit your kind consideration.

Kind regards,

Rajan S. Mathews

Rajan S. Mathews
Director General

CC : Shri. Anil Kaushal, Member (T), DoT

COAI

RSM/COAI/2013/196
October 30, 2013

Shri. M. F. Farooqui
Secretary
Department of Telecommunications
Sanchar Bhawan, 20 Ashoka Road
New Delhi - 110001

Dear Sir,

Subject: Auction of spectrum in 800MHz band as E-GSM

Reference: COAI Letter No. RSM/COAI/2013/106 dated May 31, 2013
COAI Letter No. RSM/COAI/2013/168 dated September 19, 2013

1. This is with reference to our earlier letters wherein we have made several representations to the Government to reconfigure the existing 800MHz band and offer it as E-GSM /E-900MHz as:

   a. It will result in far more efficient utilization of spectrum in 800 MHz band.
   b. This spectrum will be used for growth of broadband and will maximize overall revenue for the exchequer in the long run.
   c. This would also be in line with international practices.

2. Given the diminishing demand for 800 MHz band, it has been our request that the Government should harmonize 800 MHz band and make the 10 MHz of E-GSM band a part of the overall 900 MHz band to be auctioned at the earliest.

3. We are however concerned that the Government in its reference back to TRAI has put forward various difficulties in implementing E-GSM.

4. It is submitted that given the diminishing interest in CDMA, the lack of interest in this band at the last auction, it would be most undesirable to lock up this valuable sub 1GHz band in a less efficient use. The utilization of 800 MHz band as compared to 900/1800MHz is nominal as shown below:

Sl. No.	Parameter	GSM (1800 MHz/ 900 MHz)	CDMA (800 MHz)	Efficiency of CDMA as compared to GSM
1.	Subscriber per MHz	744,097	283,760	38%
2.	Revenue in crores per MHz	93.76	32.35	34%
3.	Annual spectrum usage charge in crores per MHz	4.58	0.65	14%

Note: 1. The figures have been derived from the TRAI PMR report for March 2013
2. The spectrum usage charge has been derived basis Q4 2012-13.

14, Bhai Veer Singh Marg, New Delhi – 110 001
tel: +91-11-23349275 fax: +91-11-23349276 email: contact@coai.in website: www.coai.in

COAI

5. We support and endorse the TRAI view in its reply to the reference, where the TRAI has stated:

> *"...The Hon'ble Supreme Court has also observed in its opinion on special reference no. 01/2012 dated 27th September 2012 that "no part of natural resource can be dissipated as a matter of largess, charity, donation or endowment for private exploitation. Each bit of natural resource expended must bring back a reciprocal consideration. The consideration may be in the nature of earning revenue or may be to „best sub serve the common good." It may well be the amalgam of the two. There cannot be a dissipation of material resource free of cost or at a consideration lower than their actual worth. One set of citizens cannot prosper at the cost of another of citizens, for that would not be fair and reasonable."*

6. The TRAI has noted that as per present allocations, it is possible to make available at least 5 MHz spectrum for the up-link of E-GSM band in all 22 LSAs. In the downlink (925-935 MHz), TRAI has noted that in case even 2 MHz of spectrum is vacated by defence, then it will be feasible to carve out 5 MHz of spectrum for the E-GSM band.

Our Submission

In view of the above, we urge the DoT to kindly consider the above TRAI proposal and put at least 5MHz of E-GSM to auction at the earliest. It is reiterated that allocation of E-GSM band for India will facilitate optimum utilization of the precious national resource and also benefit the Government in helping improve the Broadband availability in the country.

We urge your most kind consideration and support for our above request.

Regards,

Rajan S. Mathews

Rajan S. Mathews
Director General

CC : **Shri. Arvind Mayaram, IAS, Secretary, Economic Affairs, Ministry of Finance**
: **Shri. J. Satyanarayana, IAS, Secretary, Department of IT**
: **Shri. Saurabh Chandra, IAS, Secretary, Department of Industrial Policy & Promotion**
: **Smt. Sindhushree Khullar, IAS, Secretary, Planning Commission**
: **Shri. Anil Kaushal, Member (T), Telecom Commission**
: **Shri. S. C. Misra, Member (S), Telecom Commission**
: **Ms. Annie Moraes, Member (F), Telecom Commission**

14, Bhai Veer Singh Marg, New Delhi – 110 001
+91-11-23349275 +91-11-23349276 contact@coai.in www.coai.in

Annexure G

Some International examples of Extension of licenses

Belgium

The Belgian Institute for Postal services and Telecommunications (BIPT) extended two of the existing three 900 MHz licenses from 2010 until 2015, with these extended licenses co-terminating with the third 900 MHz license. In the original Royal Decree, the possibility of an extension for a period of 5 years was presented. Two operators (Belgacom Mobile and Mobistar) licenses were extended on this basis for 5 years. The fees for this extension were based on the original Spectrum Access fee per MHz paid in respect of their existing licenses. The operators had the possibility to pay a once-off fee or to pay per year (which they chose). The original license was for a period of 15 years; therefore the two operators pay 1/15th of the original amount per MHz per year for their extended 900 MHz licenses. In April 2010, BIPT adopted a decision on the introduction of UMTS in the 900 MHz band, since then UMTS has been deployed in the 900 MHz band.

Malta

In February 2009, the Malta Communications Authority (MCA) published a consultation outlining future licensing proposals and assignment mechanisms for the 900 and 1800 MHz bands. The consultation phase was followed by a round of bilateral meetings to clarify respondent's views and on 16 July 2010 the MCA published its analysis of stakeholders comments together with its final decision. **The decision addresses numerous issues, including interim measures to deal with differences in the existing license expiry dates (2010 and 2011).** The MCA published a call for applications from prospective licensees on 27 October 2010, and there were three expressions of interest submitted by the closing date of 14 January 2011, which are now being evaluated by the Maltese authorities.

The licenses of incumbent operators were extended to ensure continuity of GSM services until the new licenses come into effect. A provision was present in 900 MHz licenses which empowered the Authority to add or amend any of the license terms and conditions, which it enacted in the form of written correspondence with licensee. Currently the existing licenses in the 900 MHz and 1800 MHz bands have different termination dates. In order to ensure a smooth migration, the July 2010 Decision stipulated that the existing GSM licenses were being extended by a few months pending the completion of the re-assignment process of 900 MHz and 1800 MHz spectrum. These extensions were intended to be issued once off and non-renewable. **The licenses retained the terms and conditions of the initial license and granted no additional rights to the existing license holders.**

Netherlands

Two licenses in the 900 MHz band (held by KPN and Vodafone), were renewed in 2008 in order to extend the length of license from 2010 to 2013, resulting in co-termination with other 900 MHz licensees. The fee paid by KPN for the 3 year extension for their 2 × 12.4 MHz 900 MHz assignment was €39.8m, and Vodafone's fee was €36.6m for the 3 year extension of their 2 × 11.4 MHz 900 MHz assignment.

In setting the fees, the Ministry for Economic Affairs calculated the financial advantage for the 900 MHz license holders (KPN and Vodafone) of the prolongation of the licenses, and charged accordingly. The method used was based on an estimate of the value of the license (for the residual period, 2010 - 2013) for an alternative

operator that did not have a 900 MHz license, taking into account numerous factors such as existing market shares for Vodafone and KPN and sunk costs in network deployment to name but two. The method was accepted by all license holders and most alternative operators.

All future spectrum rights in the 900 MHz and 1800 MHz bands will be awarded through an open auction, to be held one year in advance of expiry..

Switzerland

Switzerland NRA (ComCom) had in 1998, awarded two GSM licenses for a 10-year term within the framework of a "beauty contest" (to Orange and Diax/Sunrise). Another license with the same term had already been granted to Swisscom under the Telecommunications Act. .

1. In December 2003, ComCom awarded a GSM licence to Tele2 and In&Phone respectively.
2. In February 2007, ComCom took a decision in principle to renew the expiring licences of Orange, Sunrise and Swisscom for approximately 5 years. **The objective was to achieve chronological harmonization with the term of the Tele2 and In&Phone GSM licences, which expire at the end of 2013.**
3. The GSM licenses, which were provisionally extended in April 2008, were renewed by ComCom up to the end of 2013. This meant that all GSM licenses expired at the same time (Swisscom, Sunrise, Orange and In&Phone). This gave ComCom (as per its statement) **an opportunity to implement a comprehensive reallocation of all the mobile telephony frequencies which were free then or which were to become free in 2013 or 2016.**
4. It carried out a detailed Consultation in the year 2009 for getting stakeholder opinion on the same and concluded the same with an analysis at the end of year 2009.
5. A simultaneous auction was SUBSEQUENTLY carried out in 2011 for **spectrum expiring at the end of 2013 and that expiring at the end of 2016 (*clubbed togetherforthe purpose of achieving more efficient frequency allocation)*.**

Annexure H

Impacts due to Bulk MNP Porting

Taking example of typical A category service area, where two existing operator due for extension, have a combined base of nearly 35Mn Subscribers. If such operators cannot win back spectrum, then following will be high level impacts:

1. **Service Delivery Related Impacts:**
   a. Per day Porting will increase by 4Lakh even if the porting is spread over a period of 3 months.
   b. Per day activation verification requests will increase, assuming that these 4lakh customers (per day) get ported into 5 operators in that circle, the additional porting verification will increase by 80,000 for such operators.
   c. Additionally, there will be an increase in the number of documentations to be verified per day. The above mentioned increase in porting, activation and documentation will be over and above the existing numbers and will be impossible to handle.

2. **IT Related Impacts**:
   a. UPC handling systems would have to be augmented and since operators would be closing operations there would be challenges to invest into the system enhancement.
   b. The Number Porting Gateways of the Operators need to be augmented.
   c. Assuming **top 2 operators are asked to close down in 10 circles, then t**he approximately porting would be required for 300 Mn subscribers, in addition to the current MNP counts of 62 Mn.
   d. Currently there are no vendors that support MNP for such a huge database and this is a technical system limitation. Hence MNP cannot be a means for mass porting.
   e. Further, the porting activation and provisioning will not be possible within the porting window and there will be a lot of subscriber complaints and routing issues.

3. **Network Related Impacts:**
   a. At present, the systems are already running close to the dimensioned 70% utilization. If any bulk porting takes place in future which is not foreseen, then there will be a huge challenges.
   b. **Dimensioning, Uncertainty:** There will be no logic of dimensioning or no projections based on which operators will be able to know what should be the MNP Database size to be considered for dimensioning and when to make the network ready for that.
   c. **Signaling traffic Migration across Pan India for MNP Dipping:** There will be a very huge migration required at operators end as signalling traffic of all circles which require MNP dipping will have to be migrated towards the new MNP Nodes. Timelines to migration should take not less than another 1-1.5 years to completely migrate signalling traffic of all own circles and signalling traffic of other operators.
   d. **Threat of existing MNP getting impacted**: In case there are any bulk portings that happen in near future, the current systems will not be able to take up the porting requests beyond the 100Mn capacity and hence the numbers will not be able to be provisioned in the MNP Database. This may lead to impact for the voice calls and SMS.
   e. Network Readiness of Other Operators: Another area apart from the above mentioned is the core network readiness of other operators who need to provision these bulk ported-in subscribers, need to have their Core network, VLRs, HLRs, IN systems enhanced to accommodate the sudden spur of subscribers in their network.