TELECOM REGULATORY AUTHORITY OF INDIA

Recommendations

on

Reserve Prices for auction of FM Radio channels in New Cities

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Chapter I

Introduction

1.1 Frequency Modulation (FM) Radio broadcasting, due to its versatility, is considered a powerful medium to provide entertainment, information and education. FM Radio broadcasting was opened up to participation of the private sector by the Ministry of Information and Broadcasting (MIB) in 1999. During the succeeding years, progressive growth of FM Radio channels has been achieved in a phased manner. Thus at present, 243 FM Radio channels are operational in 86 cities; 21 private FM Radio channels were set up in Phase-I and an additional 222 FM Radio channels were set up during Phase-II. Phase-I operators migrated to the Phase-II FM Radio regime with effect from 1st April, 2005.

1.2 Policy Guidelines for Phase-III of FM Radio Broadcasting through private agencies (hereinafter referred as 'the Phase-III policy') have been issued by the Government on 25th July 2011[1]. The Phase-III expansion of FM Radio broadcasting services seeks to pave the way for introduction of private FM Radio channels in 253 new cities each with a population of more than 1 lakh as per Census 2011. Further, 11 other cities with a population less than 1 lakh in the border areas of Jammu & Kashmir (J&K) and the North East (NE) region are also proposed to be included in the Phase-III expansion. In total 831 FM Radio channels would be put up for auction in 264 new cities (253 having population more than 1 lakh and 11 in border areas).

[1] http://www.mib.nic.in/WriteReadData/documents/PolicyGuidelines_FMPhaseIII.pdf

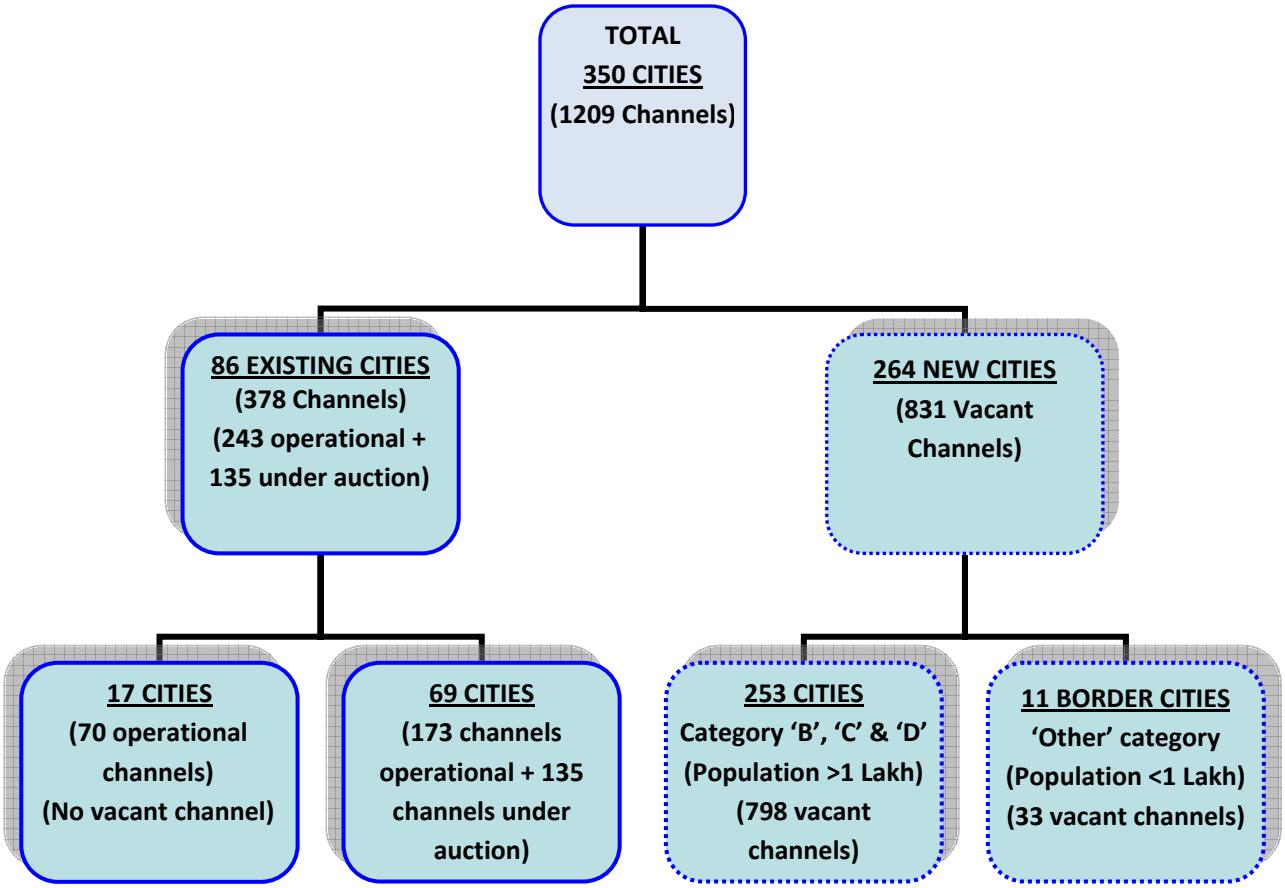

Fig. 1: Pan-India distribution of FM Radio Channels (Existing and New Cities)

1.3 Figure 1 above provides a complete pictorial representation of the pan-India distribution of existing and proposed new cities and the number of FM Radio channels open to participation of private FM Radio operators.

1.4 MIB through its letter dated 16th December 2014 (**Annexure-I**), has sought TRAI's recommendations on Reserve Prices (RP) for FM Radio channels in 264 new cities. The list of cities with the corresponding category and the number of channels being put up for auction was provided by MIB and may be seen at Annexure-I. The 831 FM Radio channels in these cities are proposed to be auctioned through an ascending e-auction process as provided in the Phase-III policy. It is worth noting that need for revision of RPs for these cities has arisen as the methodology provided in the Phase-III

policy guidelines for determining the RPs for new cities yielded inconsistent/ irrational results.

1.5 The Authority issued a Consultation Paper (CP) on 'Reserve Price for auction of FM Radio channels in New Cities' on 6th February, 2015. Written comments on the CP were invited from stakeholders by 25th February, 2015. All the comments received were posted on the TRAI website. Subsequently, an Open House Discussion was held at New Delhi on 9th March, 2015. Based on the Open House Discussion, all stakeholders were given time till 13th March, 2015 to forward additional comments, if any, to TRAI.

1.6 After carefully examining and analysing various issues emanating from the written submissions of the stakeholders, the Open House Discussion and internal analysis, the Authority has finalised its recommendations. Chapter II discuss various issues related to estimation of the reserve prices for auction of FM Radio channels in new cities. A summary of the recommendations is provided in Chapter III.

Chapter II

Estimation of Reserve Prices for auction of FM Radio channels in new cities

2.1 The Authority recognises that the primary purpose of granting permission to private entities to run FM Radio channels in new cities is to give a boost to the FM Radio movement in the country so as to contribute to development of society, fulfill the entertainment and information needs of citizens, and promote socio-economic activity.

2.2 In addition to fulfilling entertainment and information needs of the masses, the FM Radio auction will generate direct revenue to Central Government in terms of proceeds of the auction, and will also enhance indirect revenue generation for the Central/ State Governments and Local bodies in the form of taxes, levies and other benefits because of the resultant increase in economic, social and cultural activity.

2.3 The objective of the proposed auction is to allocate FM Radio channels efficiently while ensuring that the broad policy objectives are met. In terms of the Phase-III policy, permission for 831 FM Radio channels in 264 new cities is to be granted on the basis of an ascending e-auction process. The successful bid amount arrived at through the e-auction will determine the Non-Refundable One-Time Entry Fees (NOTEF) for grant of a channel. Before commencing the ascending e-auction process, a Reserve Price (RP) has to be set for FM Radio channels in each city. The RP is the price below which a channel shall not be allocated.

2.4 The permission granted to an FM Radio operator for running a channel in a particular area entitles the operator to allotment of one spot frequency in the range of 88 MHz to 108 MHz for that area from Wireless Planning & Coordination (WPC) wing of the Department of Telecommunications (DoT).

Hence, the NOTEF, determined through the auction process, for grant of permission to operate an FM Radio channel also includes the charge for the spectrum (one-spot frequency) i.e. the NOTEF is an all inclusive charge for the bundled permission. The grant of permission for an FM Radio channel without bundled spectrum (one-spot frequency) would not serve any purpose as FM Radio services cannot be started without the allocation of a spot frequency.

2.5 In the Phase-III policy, all cities have been grouped based on two parameters, namely, the categorization of the city by size of population and by the geographical region to which the city belongs. On the criterion of size of population, cities are categorized as A^+, A, B, C, and D. The details of categorization of cities based on population are given in Table 1.

Table 1: Categorization of cities based on the population

S. No.	City type	Population in lakh
1	A+	Metro Cities
2	A	Above 20 lakh
3	B	10-20 lakh
4	C	3-10 lakh
5	D	1-3 lakh

2.6 Based on geographical location, these cities are categorized across North, East, South, and West Regions. Out of 264 new cities, the 253 new cities, having a population more than 1 lakh as per Census 2011, are of B, C, and D categories. The remaining 11 cities have a population less than 1 lakh; these fall in the border areas of Jammu & Kashmir (J&K) and the North East (NE) Region and fall in the 'Others' category.

2.7 The Phase-III policy prescribes the following rules for deciding the RP for auction of FM Radio channels:

- For new channels in existing FM Phase-II cities, the highest bid price received for that city in Phase-II.

- For fresh (new) cities, the highest bid price received during FM Phase-II for that category of cities in that region.
- In case the benchmark from Phase-II for a particular region is not available, then the lowest of the highest bid received in other regions for that category of cities.
- For new cities in border areas with a population less than one lakh the reserve price shall be Rs. 5 Lakh.

2.8 Accordingly, as per the Phase-III policy, the RPs for FM Radio channels in 253 new cities were to be derived based on the highest bid prices received in Phase-II for existing cities. For 11 border area cities, the RP was fixed at Rs. 5 lakh for each city.

2.9 The MIB reference seeks TRAI recommendations regarding the RPs for FM Radio channels in 253 new cities and 11 border area cities. When the methodology specified in the Phase-III Policy is used to derive the RPs, for 253 new cities (where no private FM Radio channels are operational), the results were found to be inconsistent/ irrational. The computation of the RP is based on the categorization of the city by size of population and by the geographical region to which the city belongs. RPs so derived vary significantly - some are very high and some are very low. The contrast is particularly striking vis-à-vis the revenue generation potential in these new cities. Hence, a decision was taken by MIB to determine the RPs for these cities afresh.

2.10 The current reference from MIB for providing reserve prices is confined to the 264 new cities only. This has no bearing on the RPs already fixed by the Government for auction of FM Radio channels in existing cities as per the Phase-III policy. And, that auction process for existing cities is under way.

2.11 For fixing the RPs for auction of spectrum, TRAI has followed a consistent process since 2012. The first step requires the determination of the

valuation of spectrum. The second step is to derive the RP on the basis of the valuation. The valuation of spectrum depends on multiple factors like macro-economic indicators, proposed use, available technological options, revenue generation potential, likely changes in scenario over the permission period, and market dynamics. Hence, to estimate the valuation of FM Radio channels in new cities in Phase-III, it is necessary to (a) identify variables which are likely to have an impact on revenue generation and, (b) factor in the price information on radio channels revealed in the Phase-II auction. Essentially, a way has to be found to link actual bid prices in the Phase-II auction to the new cities. While the current exercise for fixing of RPs for FM Radio channels in new cities is based on the limited information available with the Authority, the impact of future events is expected to be factored in the bid prices by bidders during the e-ascending auction process.

2.12 FM Radio broadcasting is a Free-to-Air (FTA) service and advertisements aired on the channel are the primary source of revenue. The 264 new cities, where FM Radio channels are to be auctioned in Phase-III, are largely Tier-3 cities[2]. This auction is, therefore, different from the previous auctions in Phases-I & II which primarily covered Tier-1 and Tier-2 cities (i.e. four metros, State capitals and other major cities) where a large part of India's economic activity is concentrated.

2.13 The CP outlined an approach for estimation of the RP of FM Radio channels in the new cities. The fixing of RPs for these new cities would require an approach which is more suitable for nascent markets. Optimally set RPs will induce participation by a large number of competitors in the auction while the inherent design of an ascending e-auction would enable discovery of the underlying market value (price) of FM Radio channels in each city.

[2] Here, Tier-I cities refers to the cities having population above 20 lakh, Tier-II cities have population below 20 lakh but above 3 lakh and Tier 3 cities have population below 3 lakh.

2.14 For determining valuation of FM Radio channels in new cities, the CP identified multiple proxy variables. The CP discussed the two already identified variables for grouping of new cities in the Phase-III policy - (1) Population, and (2) Geographical region. It was pointed that the population of a city is indeed a major relevant variable. However, there are some difficulties in using geographical region as the second relevant variable.

2.15 What is the problem in using geographical region as a second relevant variable for grouping of new cities? It is certainly true that prices realized in the FM Radio Phase-II auction varied across geographical regions. However, the region itself is merely a proxy variable for many other underlying variables. And, sometimes, it is not a good proxy. First, within a region there may be large disparities, say, in terms of per capita income. For instance, though UP and Haryana fall in the Northern region, there is a vast difference in per capita incomes, which, in turn, determines the willingness to pay by advertisers as well as the demand for FM radio services. The per capita GSDP of Haryana is Rs. 1,20,500 , which is more than three times the per capita GSDP of Uttar Pradesh (UP) which is Rs. 34,000. Second, the region also masks the listenership figures for FM radio. These two can vary significantly across States even within a region. Finally, the revenues earned by existing FM Radio operators also vary significantly across States within the same Region. In fact it is possible that cities in different geographical regions may have the same revenue generating potential and, therefore, ought to be grouped together. Hence, using region as a second characteristic for a two-way classification of cities is fraught with risks of errors. It is, therefore, necessary to look beyond region at other variables which influence the revenue-earning potential of an FM Radio station.

2.16 Since advertisement is the primary source of revenue generation for FM Radio, factors such as purchasing power of a citizen, total FM radio listenership and past revenue earning data appear to be relevant variables

for assessing the economic activity of the city/ region. Therefore, together with population, three other relevant variables were identified, for grouping of similar revenue generation potential cities. These were (1) Per capita income, (2) Listenership of FM Radio, and (3) Per capita Gross Revenue (GR) earned by existing FM Radio operators. The revenue earning capabilities of a channel in a city can be factored using these three characteristic variables. This can be mathematically represented as:

V = F (Per capita Income, FM Radio listenership, Per capita gross revenue earning of FM Radio operators; Population)

V = Valuation of FM Radio channel, F – function of

2.17 The revenue generation potential of a city depends on the level of economic activity in that city/ region. If it is presumed – even though it may not be true in some cases - that coverage area of a particular FM Radio station is spread over the district surrounding the city, the Gross District Domestic Product (GDDP) of that particular district could be used as a proxy indicator of the level of economic activity for that city/ region. However, GDDP data for FY 2011-12 for all States and UTs is not available. The closest variable for measuring the level of economic activity in a particular city/ region could be the GSDP. Therefore, per capita GSDP of a State is taken as a proxy indicator for assessing the level of economic activity and, hence, the revenue generation potential in that State.

2.18 The data for Radio listenership in new cities is not available. Therefore it needs to be estimated based on certain proxy variables which are measurable and for which data is available. The Radio listenership directly depends on the penetration of radio receivers; the larger the number of radio receivers in a State, the greater is the number of radio listeners in that State. Therefore, one proxy measure for radio listenership could be the density of FM Radio receivers in a State.

2.19 Accordingly, in the CP, the per capita GSDP was used as a measure of per capita income and the density of FM Radio receivers was used as a proxy measure of listenership of FM Radio. Per capita Gross Revenue earned by existing FM Radio operators is available from the GR data reported to MIB by FM Radio operators.

2.20 For the purpose of categorization of States/ UTs, based on the three identified relevant variables (Para 2.16 above), the 7 sister States of the North-Eastern region have been clubbed into one entity denoted as NE. The States of Sikkim, West Bengal and the UT of Andaman & Nicobar Islands have been clubbed together and denoted as WB. Similarly, Lakshadweep has been clubbed with Kerala and Daman & Diu has been clubbed with Gujarat. These clubbings are based on availability of figures for FM Radio receivers (total number of mobiles). Further, city centric States/UTs, viz. Delhi, Chandigarh, Goa and Puducherry, have not been considered for categorization since there is no new city in these States/UTs slated for auction as per the Phase-III policy.

2.21 In the CP, a two-stage process for estimating the RPs for FM Radio channels in 253 new cities was discussed. In the first stage, valuation of the FM Radio channels in each new city is to be determined. In the next stage, the RP for each new city is to be calculated from the valuation of the FM Radio channels.

2.22 The CP provided details of the method proposed for estimating the value of FM Radio channels in new cities. In brief, these were the steps envisaged:

a. The cities to be regrouped based on the identified three relevant variables, into multiple groups.
b. The price information available from Phase-II auction to be used to determine the valuation of FM Radio channels for a group of new cities.

c. To take into account the increase in the permission period from 10 years to 15 years, a factor of 1.5 is to be applied.
d. Similarly, for accounting inflation, a factor of 1.798[3] based on WPI, for the period from 1st April 2005 up to 31st December 2014, is to be applied.

The complete methodology was explained in the CP along with illustrations. Stakeholders were requested to give their comments on the approach/ methodology proposed in the CP or to suggest an alternative approach/ methodology for determination of the valuation of FM Radio channels in 253 new cities in Phase-III.

2.23 In response, most stakeholders did not agree with the proposed approach/ methodology. They were of the opinion that it would lead to a very high RP, thereby rendering channels in small towns unviable. However, stakeholders did not provide any alternative methodology[4].

2.24 Before analyzing the responses to the CP, it merits mention that the reference of MIB is very specific; seeking TRAI recommendations regarding RPs of 264 new cities. It does not seek RPs of vacant channels in existing cities where the auctions were held in Phase-II. Further, the bidding process has been clearly spelt out by MIB in the policy document. It may also be noted here that valuation of FM Radio channels for new cities has to be worked out on the basis of variables likely to impact revenue generation. However, because of limited availability of such information, linkages have to be developed between available information and market discovered prices. Thereafter, such information has to be extrapolated to new cities. In short, a mathematical model has to be developed for determining valuation of FM Radio channels.

[3] Source: Office of the Economic Adviser website
[4] Note: only some minor tweaking of weights on variables was suggested.

2.25 We now turn to examine the issue based comments of stakeholders keeping in view the background narrated above.

Comments on Reference price:

2.26 In the CP, it was proposed that the reference price of an FM Radio channel in a city could be the average of all successful bid prices received during the Phase-II auction for that city. The reference price of, say, Chandigarh is the average of successful bids received for Chandigarh in Phase-II auction. The valuation of the FM Radio channels in a new city could be derived from this reference price. The RP for each new city will then be calculated from the valuation of the FM Radio channels in that city.

2.27 No specific comment on the methodology to derive a reference price for FM Radio channels in a city was given nor was any alternative method suggested. One stakeholder said that the methodology indicated in CP was a good way to arrive at a final valuation. Most stakeholders were of the opinion that RP should be kept low – in fact as low as possible. They argued that the logical RP for Phase-III auctions should be based on the RP of Phase-II bidding i.e. 25% of the highest bid received in Phase-II or the lowest bid of Phase-II. Their argument is that even at the RP of Phase-II - which was 25% of the highest bid received - many frequencies were left un-allotted. They argued that the design of an ascending e-auction will ensure fair market prices discovery.

2.28 It is important to note that the RP refers to the minimum amount that the owner of an item will accept as the winning bid amount. It depends on past valuations of the item and the factors that are relevant in the current scenario. Since no unique price of an FM Radio channel is available from the past (Phase-II bidding), the average of all successful bid prices received during the Phase-II auction for a city is considered as the reference price. Also, this method of determining the reference price was used by the Government for migration of Phase-I FM Radio operators to Phase-II policy

regime. The current RP cannot be linked with the lower cut-off price (referred to as RP of Phase-II by stakeholders) that was revealed in the past. In the Authority's proposed methodology, RP is derived based on past revealed valuation and not on the basis of the past RP. Further, if the RP is kept too low then it may lead to a collusive bidding and loss of revenue to the Government. Therefore, the Authority is of the view that the reference price of an FM Radio channel in a city, for valuation of an FM Radio channel in new cities, should be the average of all successful bid prices received during the Phase-II auction for that city.

2.29 On the question of considering the lowest bid of Phase-II to determine reserve price instead of an average (or that RP should be kept as small as possible), it should be noted that FM Radio Phase-II auction was a closed-bid auction and the cut-off for a city was kept at 25% of the highest bid received in that city. Since the amount of the highest bid was not known to bidders (because of closed bidding), therefore, the cut-off price for a particular city and the level of interest of competing bidders in that city was not known ex-ante to bidders while submitting the bids in Phase-II. No subsequent option was available for enhancing or altering the bid amount once submitted. As a result, some bids could have been below 25% of the highest bid resulting in some frequencies remaining un-allotted. In the case of an e-auction, the RP as well as the level of interest of competing bidders in a city is known to a bidder participating in the auction and, therefore, bidders get a chance to re-evaluate their strategy. Therefore, many frequencies during Phase-II might have been left un-allotted due to the constraints of closed bidding and not because of the higher RP.

Comments on relevant variables:

2.30 In the CP, it was proposed that in addition to population, three other variables (1) Per capita GSDP, (2) Density of FM Radio receivers, and (3) Per capita Gross Revenue earned by existing FM Radio operators, could be

considered relevant for grouping of similar revenue generation potential cities.

2.31 Some stakeholders supported TRAI's approach of replacement of categorization based on "region" by a combination of "per capita GSDP", "per capita Gross Revenues" and "listenership". However, they were of the opinion that the region still matters, as the South is the best region for radio, followed by the North and West, the East region is a laggard in radio listenership and monetization. They were also of the opinion that the States which have similar levels of per capita GSDP can have different levels of revenue earning potential.

2.32 Some stakeholders opined that the number of households with radio and mobile density do not necessarily translate into revenue generation; hence, these should not be given the same weightage as the number of passenger vehicles fitted with FM Radio receivers which reflects the earning ability. Their argument is that higher mobile penetration does not lead to more FM radio consumption. They have stated that IRS (Indian Readership Survey) data indicates that FM radio penetration is barely 25% of the population in a city like Delhi or Mumbai, while mobile penetration in these cities is 100% or even more. They suggested that the number of households with radio and mobile density together should be given a weight of 50% and the number of passenger vehicles fitted with FM Radio receiver a weight of 50%.

2.33 The Authority has favoured a broad-based approach emphasizing three different variables and has not relied exclusively on per capita GSDP for determining the valuation of FM Radio channels in the new cities. The two other variables are able to capture differences across States having the same per capita GSDP but with different revenue earning potential.

2.34 The comments of stakeholders regarding variation in listenership across various geographical regions are in sync with the ranking of the States based on the density of FM Radio receivers derived as per the methodology

indicated in the CP. While most States of the Southern, Western, and Northern region are placed in the first and second groups, most States of the Eastern region are placed in the third group. (See Annexure-IV)

2.35 Even if the number of households with radio and mobile density are given a weight of 50% and the number of passenger vehicles fitted with FM Radio receivers a weight of 50%, the results are much the same as obtained using the methodology suggested in the CP. Thus, the weighting, as proposed by a stakeholder, does not have any material impact on the grouping of States when compared to those derived using the methodology outlined in the CP. That is to say, it does not impact the valuation of FM Radio channels in new cities based on total density of FM Radio receivers.

2.36 Advertisement revenue, as already stated, is the primary source of revenue for FM Radio operators. The rate as well as the duration of advertisement directly depends on the size of the pool of potential listeners and the nature of economic activity in that city/ region. Potential listenership in a city/ area depends on number of mobile handsets and radios in that city/ area. It may be noted that the mobile teledensity has been used as one of the proxies to assess the listenership potential in the States. The listenership potential of FM Radio in a city/area is directly proportional to the density of FM Radio receivers in a city/area but that does not mean that listenership is equal to the density of FM Radio receivers. A city with larger potential listenership would attract better rates and larger duration advertisement. Hence, there is a clear link between the variable (radio and mobile density) and revenue earning potential.

2.37 In view of above, the Authority is of the opinion that the identified variables namely (1) Population, (2) Per capita income, (3) Listenership of FM Radio, and (4) Per capita Gross Revenue earned by the existing FM Radio operators, are the relevant variables for valuation of FM Radio channels in

new cities and their use for determination of RP, as suggested in CP, is justified.

Comments on indexing for inflation:

2.38 Most stakeholders suggested that the 1.798 factor adjustment for inflation based on WPI should not be used. They said that advertisement rates on FM Radio have actually fallen over the last 6 years. They further suggested that advertisement rates and the valuations of the FM Radio industry should be taken into account to determine the inflation factor. Some stakeholders added that the spread of digital streaming will further dampen radio advertisement pricing.

2.39 Stakeholders have opposed the use of a WPI-based factor. However, they have not suggested any other specific factor, which is published by Central Statistical Organisation (CSO) or any other institute of repute, that could be used for indexing inflation for the valuation of FM Radio channels. Stakeholders have also not substantiated their claim with supporting data about the decline in rates of advertisements since April, 2005 or the valuation of the industry. Further, the advertisement revenue depends on both the duration of advertisements aired during a particular period and the advertisement rates. As per GR data available, the total GR for 53 channels, which have been operational since 2006-07, has increased by approximately 120% till 2013-14. Hence, even if a justification was available (which is not the case) indexation based solely on advertisement rates alone would be neither appropriate nor justified.

2.40 The Authority has been following an approach based on WPI to provide the indexation for inflation of tariff ceilings applicable to the broadcasting sector. Therefore, the Authority is of the view that, of the options available for indexing inflation to the valuation of FM Radio channels in new cities, the WPI is the most relevant.

Comments on factor used for a longer licence period:

2.41 Most stakeholders are of the opinion that an additional multiplication factor of 1.5 is not justified. Why? Because in addition to One Time Entry Fee operators pay a license fee and that factors in the increased period of the license. They also argued that online/digital streaming will start affecting FM radio in 5 years and, thereafter FM radio revenue growth could turn flat or negative from the 10th year or so.

2.42 The contention that a multiplication factor of 1.5 is not justified because annual license fee already factor in the increased period of license is not sustainable. The NOTEF and annual license fee are two different levies. The NOTEF cannot be the same for the permission period for 10 years – as was in the case of Phase-II and 15 years – as is in the case of Phase-III.

2.43 The argument that digital streaming will slow the growth of FM Radio broadcasting is also not tenable as digital streaming is generally in Unicast or Multicast mode, whereas FM Radio works in broadcast mode. Further, digital streaming is generally a paid service while Radio broadcast is Free to Air. These two services cater to different classes of listeners and belong to two different markets. While FM Radio receivers are easy to use and are affordable, receivers used for digital streaming are complex to use and costlier. Listeners who are able to manage and pay for online streaming are limited. On the other hand, Radio broadcast is popular with people belonging to all strata of society. Further, the CP also discussed many other economic as well as sector-specific developments that have taken place since the Phase-II auctions. During this period, the availability of FM Radio receivers in mobile handsets has considerably increased FM Radio listenership. The Phase-III policy permits the networking of radio stations and broadcasting of All India Radio (AIR) news bulletin. All these factors affect the valuation of an FM radio channel. The exact impact of these factors on valuation of FM radio channels cannot be quantified at this stage. However, it will most certainly be positive. The exact impact of all

these factors may vary in the eyes of prospective bidders. Therefore, the Authority is of the view that the apprehension of stakeholders regarding the adverse impact of digital streaming on the FM Radio market is not sustainable, at least based on the inputs available today.

2.44 After examining and analyzing the comments of the stakeholders, the Authority is of the view that the methodology proposed in the CP for valuation of FM Radio channels is both valid and reasonable. Further, in Para 2.37, it has already been concluded that population, per capita GSDP, the density of FM Radio receivers, and the per capita GR are the relevant variables.

2.45 The Authority has, therefore, decided to determine the valuation of FM Radio channels using, in addition to population, three other variables i.e. the per capita GSDP, the density of FM Radio receivers, and the per capita GR. The methodology proposed in the CP as explained in Para 2.49 below, would be employed. Once values of FM Radio channels for new city are computed using the variables, an average of all values, so derived would be computed. This average value would be the valuation of FM Radio channels for the new city. The averaging, as detailed below, at multiple stages reduces any statistical errors that may have crept into the process due to limited availability of data points of reference prices especially for category C and category D cities and non-availability of primary data on listenership and advertisement potential in these cities.

a. Average of all successful bid prices received in Phase-II in a city to arrive at the reference price of an existing city,
b. Average of the reference prices computed for the group of cities classified based on a particular variable for the new cities; and,
c. Average of the value of FM Radio channels for the new cities derived using different variables to obtain a final valuation.

2.46 The population[5] figures of census 2011 and the GSDP[6] figures for FY 2011-12 have been utilized to calculate the per capita GSDP of each State. To ensure consistency of data across variables, secondary data for the year 2011-12 have been used for all variables.

2.47 For estimating density of FM Radio receivers in each State, data from multiple sources have been used. The State-wise data on percentage of households possessing a radio/transistor has been obtained from the 2011 Census[5]. For estimating the number of mobile handsets based FM Radio receivers, wireless teledensity data (as on 31st March 2012) available with TRAI has been used. In addition, to estimate the number of vehicles fitted with FM Radio receivers, the data related to total number of cars, jeeps, taxis, omnibuses and Light Motor Vehicles (passenger) registered with the respective State Transport Departments as on 31st March 2012, as available with the Ministry of Road Transport and Highways[7], Government of India, has been utilized. The data from diverse sources has been consolidated and utilized to assess the overall density of FM Radio receivers per hundred persons in a particular State.

2.48 Data of station-wise Gross Revenue (GR), reported by each FM Radio operator, has been obtained from MIB. The per-capita GR in a State has been estimated by dividing the sum of GRs reported for all the cities where FM Radio stations are operational in that particular State by the population of that State.

Methodology for arriving at valuation of FM Radio channels in New Cities

2.49 The details of the steps involved in the valuation of FM channels in new cities, using the methodology proposed in the CP, are explained below**:**

[5] http://censusindia.gov.in/
[6] http://pib.nic.in/archieve/others/2013/dec/d2013121703.pdf
[7]

Step-1 One dominant characteristic (variable) is the population in a city. This yields a classification in terms of category A+, A, B, C, and D cities. However, since the FM Phase-III auction for new cities deals only with category B, C, and D cities, these are the categories that are taken into consideration. This variable remains common across the methods.

Step-2 As discussed in Para 2.16 earlier, there are three additional characteristics (variables) - per capita income, Gross Revenues (GR) earned by the FM Radio operators in the existing cities, and estimated FM radio listenership - which vary from one to another method. The values of these variables are estimated on the basis of available data on a State-wise basis. Based on the numerical values obtained, States are divided into three groups. States with more than 25% of the mean value of the concerned variable are placed in the first group. States with less than 25% but more than -25% of the mean value of the concerned variable are placed in the second group. States with less than -25% of the mean value of the concerned variable are placed in the third group.

Step-3 On the basis of the State-wise estimates of per capita GSDP, States are categorised and divided into three groups J, K, and L **(Annexure-II).** A similar exercise is replicated for the other two variables, namely, per capita GR earned and density of FM Radio receivers. This yields three groups, F, G, and H, based on the per capita GR **(Annexure- III)** and another three groups, Q, R, and S, based on density of FM Radio receivers **(Annexure- IV)**.

Step-4 Taking population size as one characteristic and one of the other three variables as the second characteristic, existing cities are classified into a 3x3 matrix in which each cell contains a group of existing cities. For instance, Amritsar, Coimbatore, Kochi, Madurai, Rajkot, and Vadodra, which all belong to category 'C' based on population and group J based on per capita GSDP, are classified in the (1,1) cell of Matrix-I.

Similarly all remaining existing cities of categories 'B', 'C', and 'D' are further classified into each cell of Matrix-I **(Annexure- V)**. On similar lines, two other matrices, namely Matrix-II **(Annexure- VI)** based on the per capita GR and Matrix-III **(Annexure- VII)** based on density of FM Radio receivers, are derived.

Step-5 The average of all successful bids received in Phase-II in each existing city is calculated. This provides the reference prices for existing cities. These reference prices are then individually multiplied by 1.5 to factor in the increase in the permission period from 10 to 15 years and by 1.798 to factor in the inflation for the period, from 1st April 2005 up to 31st December 2014 based on WPI. These are termed the indexed reference prices **(Annexure- VIII).**

Step-6 Once the indexed reference prices and three matrices referred to above are available, the indexed reference prices are mapped to the existing cities classified in each cell of the matrices (Matrix-I, Matrix-II and Matrix-III). The mapping links indexed reference prices to the cities in that group. Then, for each cell, an average of the indexed reference prices of the cities falling in that cell is determined i.e. the total sum of the indexed reference prices of all cities in the cell is divided by the number of cities in the cell. **(Annexure- IX, X, and XI)**

Step-7 The above steps yield three 3x3 matrices corresponding to Matrix-I, Matrix-II and Matrix-III with averages of indexed reference prices assigned to each cell. This effectively establishes a relationship between city characteristics and prices for cities where auctions were held in Phase-II. (**Tables – 3, 4, and 5**)

Step-8 Now, the new cities are classified in terms of their population size (B, C or D) and the other three State-level variables. For each new city, three numerical price values are obtained from the matrices arrived at in

Step 7. For instance, suppose a new city of category C falls in groups J, R and H against the three other State level variables. Then the prices from the relevant cell of the relevant matrix are mapped to the city i.e. the price values contained in the cells corresponding to C and J in terms of per capita GSDP, C and R in terms of listenership and C and H in terms of per capita GR are assigned to each of the new cities. Thus, based on three different characteristics of these new cities, three distinct values are assigned to each of the new cities. **(Annexure- XII)**

Step-9 It is intended to determine a final valuation for FM Radio channels in each new city as the average of three values derived for each city based on the three relevant variables. To provide a sense check, it is essential to verify whether the three sets of State ranks worked out in Step-3 are indeed significantly correlated. In statistics, correlation tests are used to measure a relationship between two or more variables. Spearman's Rank Correlation Coefficient[8] is a statistical measure of the strength of a monotonic relationship between paired data. On computation, it is noted that three sets of the State ranks worked out in Step-3 are indeed correlated with each other. **(Annexure- XIII)**

Step-10 To arrive at a final valuation for FM Radio channels in each new city, the average of the three values assigned (see Step 8) to a new city is computed. **(Annexure- XII)**

2.50 For a clear understanding of the modelling, separate flow charts (for each of the three variables) are provided in Annexure-XIV.

[8] http://www.rgs.org/NR/rdonlyres/4844E3AB-B36D-4B14-8A20-3A3C28FAC087/0/OASpearmansRankExcelGuidePDF.pdf

2.51 The details of the steps involved in calculation of the valuation of FM Radio channels in new cities can also be explained mathematically in the following way:

i. Let X be the set of the 70 existing cities in categories B, C, and D i.e.

$X = \{X_i\}$

Here X_i is the name of the i_{th} existing city and i varies from 1 to 70.

ii. Let P_i be the average of all successful bids received in Phase-II for the i_{th} existing city i.e. P_i is the reference price for an i_{th} existing city

P_i = Average (P_{i1}, P_{i2}, …., P_{in})

Here n is the number of successful bids received in a city, P_{in} is the price of n^{th} successful bid of the i_{th} existing city, and i varies from 1 to 70.

iii. Multiply P_i by the inflation index factor based on WPI (1.798) and the factor for the increase in the license period (1.5). This provides the indexed reference price P^*_i

iv. Let P be the set of the indexed reference prices of the 70 existing cities in categories B, C, and D

$P = \{P^*_i\}$

v. Let X_A be a [3, 3] matrix of 70 existing cities classified based on per capita GSDP (J, K, and L groups) and population (B, C, and D categories) as variables.

$X_A = [X^A_{mn}]$

Here X^A_{mn} is a group or a set of existing cities classified in cell (m, n) of the matrix i.e.

$X^A_{mn} = \{X_a\}$, m = {J, K, L}, and n = {B, C, D}

Here X_a is the name of the a_{th} existing city classified in cell (m, n).

vi. Similarly, let P_A, be a [3, 3] matrix of indexed reference prices P^*_i classified based on per capita GSDP (J, K, and L groups) and population (B, C, and D categories) as variables

$P_A = [P^A_{mn}]$

Here, P^{A}_{mn} is a group or set of indexed reference prices of existing cities classified in cell (m, n) of the matrix i.e.

$P^{A}_{mn} = \{P_a\}$, m = {J, K, L}, and n = {B, C, D}

Here P_a is the price of the a_{th} existing city classified in cell (m, n).

vii. Let $\bar{P}^{A}_{mn}$ be the average of the indexed reference prices of the group of existing cities classified in cell (m, n), and

viii. $\bar{P}_A$ is a [3, 3] matrix of the average of the indexed reference prices of existing cities classified based on per capita GSDP and (J, K, and L groups) and population (B, C, and D categories) as variables

ix. Let Y be the set of 253 new cities in categories B, C, and D i.e.

$Y = \{Y_i\}$

Here Y_i is the name of the i_{th} new city and i varies from 1 to 253.

x. Let Y_A be a [3, 3] matrix of 253 new cities classified based on per capita GSDP (J, K, and L groups) and population (B, C, and D categories) as variables.

$Y_A = [Y^{A}_{mn}]$

Here Y^{A}_{mn} is a group or set of new cities classified in cell (m, n) of the matrix i.e.

$Y^{A}_{mn} = \{Y_a\}$, m = {J, K, L}, and n = {B, C, D}

Here Y_a is the name of the a_{th} new city classified in cell (m, n).

xi. Based on per capita GSDP and population, V^{A}_{mn} is the valuation of FM Radio channels in the new cities which belong to set Y^{A}_{mn}.

Then $V^{A}_{mn} = \bar{P}^{A}_{mn}$

This determines the valuation of FM Radio channels in new cities based on the per capita GSDP and population.

xii. Similarly, V^{B}_{mn} and V^{C}_{mn} are calculated based on per capita GR and density of FM Radio receivers respectively.

xiii. Let V_{mn} be the final valuation of FM Radio channels of new cities classified in cell (m, n). Then,

V_{mn} = Average (V^{A}_{mn}, V^{B}_{mn}, V^{C}_{mn})

2.52 The above mentioned steps are explained through the following illustration:

i. Let us select a group of existing cities which belong to city category D based on population and group J of States based on per capita GSDP. There are three cities - Hissar, Karnal and Shimla – in this group. The details of the bids in the Phase-II and their averages for these cities are as follows:

Table-2: Reference price calculation

(Values Rs. in Lakh)

S. No	City	State	Bid 1	Bid 2	Bid 3	Bid 4	Average Bid Amount i.e. Reference price
1	Hissar	Haryana	61	50	27	27	41
2	Karnal	Haryana	90	71			81
3	Shimla	Himachal Pradesh	126	81	51		86
Average of reference prices of three cities							69

ii. Therefore, the average of the reference prices for cities with (D, J) characteristics is X = Rs. 69 lakh (rounded off)

iii. Apply the factor for increase in permission period from 10 to 15 years i.e. Y = 1.5X = 1.5 x 69 = Rs. 104 lakh (rounded off)

iv. Apply the factor for inflation i.e. Z = 1.798Y = 1.798 x 104 = Rs. 187 lakh (rounded off)

v. One of the new cities with (D, J) characteristics is Ambala in the State of Haryana.

vi. Therefore, the estimated value of FM channels in Ambala based on the per capita GSDP method would be Rs. 187 lakh.

vii. Similarly, the estimated value of FM channels in Ambala can be derived based on listenership and gross revenue earned methods.

viii. The average of the three (3) values so arrived at from the three methods would be the valuation of the FM Radio channels in Ambala. It is this valuation that will be used for calculating the RP.

2.53 The valuations computed based on any particular methodology are an outcome of the scientific modelling process. The model itself is founded on sound reasoning and is generally acceptable. However, because of limited availability of information, outliers in the reference data and peculiar conditions of specific cities, the valuations arrived at require a sense check. In some cases, normalization based on specific considerations becomes necessary to ensure that the valuation is both credible and as accurate as can be. Such cases have to be dealt with as exceptions. Even after normalization based on specific considerations, there may be some cities for which the RPs fixed using the scientific modelling process may look closer to the plausible valuations or lower than the 0.8 times of the plausible valuations. This is a fallout of any statistical modelling and variations in the characteristics of the individual cities which cannot be captured in the model due to limited availability of data. In reality each city is unique and the auction process would discover the valuation for each city.

FM Radio channel valuation based on GSDP

2.54 Based on the per capita GSDP, the States have been indexed and categorised into three groups as mentioned in Steps 2 & 3 of Para 2.49 **(Annexure-II)**. The categorization of the cities based on population is already available.

2.55 Subsequently, based on these two variables (population and per capita GSDP), after following the step-by-step method outlined above in Para 2.49, a valuation matrix based on per capita GSDP has been derived. A summary of the values so obtained is in Table – 3 below.

Table 3: Valuation matrix derived on the basis of per capita GSDP

(Values Rs. In lakh)

	City category based on population		
State groups based on per capita GSDP	**B**	**C**	**D**
J	1,327	454	187
K	1,080	299	-
L	661	114	43

2.56 It can be seen from Annexure-V that there is only one existing city of Gangtok with (K, D) characteristics. The reference price of Gangtok cannot be considered as a fair representative value for valuation of FM Radio channels in 74 new cities spread across seven States with (K, D) characteristics. Therefore, no reference price has been assigned to the cell (K, D). The valuation of FM Radio channels in these 74 new cities would be computed using the reference prices derived based on other two variables i.e. per capita GR or density of FM Radio receivers or both.

2.57 Similarly, all the four existing cities with (L, D) characteristics belong to NE, whereas there are 73 new cities with (L, D) characteristics which are located in seven States other than NE. The reference price corresponding to (L, D) cell cannot, therefore, be considered as a fair representative value for valuation of these 73 new cities. Now, it can be seen that Guwahati is one of the 12 existing cities with (L, C) characteristics and belongs to NE. The average of reference prices of the existing cities with (L, C) characteristics is 1.38 times the reference price of Guwahati. Applying a similar logic, the reference price of existing cities with (L,D) characteristics is multiplied by a factor of 1.38 for determining the valuation of FM channels in new cities with (L,D) characteristics located in States other than NE. For valuation of FM channels in new cities with (L,D) characteristics located in NE States, the average of reference prices of existing cities with (L,D) characteristics is

not multiplied by a factor of 1.38, as all four existing cities of (L,D) characteristics belong to NE.

2.58 Now, the new cities are categorised in terms of their population size (B, C or D) and the per capita GSDP (J, K, and L). The values determined in Table 3 are assigned to each new city categorized in the cell with similar characteristics. It provides the valuation for 179 new cities based on the per-capita GSDP **(Annexure-XII)**.

FM Radio channel valuation based on listenership

2.59 On the basis of estimated density of FM Radio receivers, the States have been indexed and categorised into three groups **(Annexure-IV)** with the logic as described in Step 2 of Para 2.49. Uttarakhand is an exception. In calculating FM Radio receiver density, the number of mobile subscribers dominates. Uttarakhand is part of the UP (West) telecom circle and, therefore, the mobile density of Uttarakhand is separately not known. Since the combined mobile density - of Uttarakhand and western UP together - is lower than the estimated mobile density of Uttarakhand alone, the computed density of FM Radio receivers of Uttarakhand is on the lower side. To compensate for the non-availability of State-specific data, Uttarakhand has been put into a group where Himachal Pradesh is placed because Uttarakhand has a geographical terrain similar to that of Himachal Pradesh.

2.60 Following the process outlined in Para 2.49, a valuation matrix based on density of FM Radio receivers has been derived. A summary of the values so obtained is in Table – 4 below.

Table 4: Valuation matrix derived on the basis of density of FM Radio receivers

(Values Rs. in lakh)

	City category based on population		
State groups based on density of FM Radio receivers	**B**	**C**	**D**
Q	1,584	667	-
R	775	243	124
S	790	146	55

2.61 It can be seen from Annexure-VII that there is only one existing city, Shimla with (Q, D) characteristics. The reference price of one city cannot be considered as a fair representative value for valuation of 24 new cities with (Q, D) characteristics spread across four States. Therefore, no reference price has been assigned to the cell (Q, D). The valuation of FM Radio channels in these 24 new cities would be computed using the reference prices derived based on other two variables i.e. per capita GSDP or per capita GR or both.

2.62 Similarly, all four existing cities with (S, D) characteristics belong to NE, whereas there are 44 new cities with (S, D) characteristics which are located in four States other than NE. The reference price corresponding to (S, D) cell cannot be considered as a fair representative value for valuation of these 44 new cities. It can be seen that the Guwahati is one of the 6 existing cities with (S, C) characteristics and belongs to NE. The average of reference prices of existing cities with (S, C) characteristics is 1.76 times the reference price of Guwahati. Applying the logic used in Para 2.57 above, the reference price of existing cities with (S, D) characteristics is multiplied by a factor of 1.76. For valuation of FM channels in new cities with (S, D) characteristics located in NE States, the reference price of existing cities with (S, D) characteristics is not multiplied by a factor of 1.76.

2.63 Thereafter, based on the two variables (population and density of FM Radio receivers), and following a process similar to that used for valuation of the FM Radio channels based on per capita GSDP earlier, the valuation of FM Radio channels in new cities based on the density of FM Radio receivers has been estimated. It provides the valuation for 229 new cities based on the density of FM Radio receivers **(Annexure-XII)**.

FM Radio channel valuation based on per capita GR

2.64 Based on the per-capita GR data, the States have been indexed and categorised into three groups **(Annexure-III)** as described in Step 2 of Para 2.49. Haryana is an exception. It has been put in a group where Punjab is placed. This is because a few important cities of Haryana (like Gurgaon, Faridabad, Panchkula etc.), which have significant revenue generation potential, are actually covered by FM Radio stations located within the boundaries of the neighboring States/ UTs.

2.65 Following the process outlined in Para 2.49, a valuation matrix based on per capita GR has been derived. A summary of the values so obtained is in Table – 5 below.

Table 5: Valuation matrix derived on the basis of per capita GR

(Values Rs. In lakh)

	City category based on population		
State groups based on per capita GR	**B**	**C**	**D**
F	1,487	465	-
G	799	263	151
H	723	132	50

2.66 There is no existing city with (F, D) characteristics. Therefore, no reference price is available for cell (F, D). However there are 52 new cities with (F, D) characteristics. Therefore, the valuation of FM Radio channels in these 52 new cities has been computed using the reference prices derived based on other two variables i.e. per capita GSDP or density of FM Radio receivers or both.

2.67 All existing cities with (H, D) characteristics belong to NE, whereas there are 59 new cities with (H, D) characteristics which are located in six States other than NE. The reference price corresponding to (H, D) cell cannot be considered as a fair representative value for valuation of these 59 new cities. It can be seen that Guwahati is one of the 13 existing cities with (H, C) characteristics and belongs to NE. The average of reference prices of the existing cities with (H, C) characteristics is 1.59 times the reference price of Guwahati. Applying logic used in Para 2.57, the average of reference prices of existing cities with (H, D) characteristics is multiplied by a factor of 1.59. For valuation of FM channels in new cities with (H, D) characteristics located in NE States, the average of reference prices of existing cities with (H, D) characteristics is not multiplied by a factor of 1.59.

2.68 Thereafter, based on the two variables (population and per capita GR), and following a process similar to that used for valuation of the FM Radio channels based on per capita GSDP earlier, the valuation of FM Radio channels in new cities based on the per capita GR has been estimated. It provides the valuation for 201 new cities based on the per capita GR **(Annexure-XII)**.

Valuation of FM channels in new cities

2.69 The three different methods discussed above, provide three separate valuations for FM Radio channels corresponding to each new city. The average of the three values corresponding to a new city is the estimated

valuation of FM Radio channels in that city. However, as discussed earlier, these valuations require a sense check and outliers require normalization. Some of the exceptions are discussed below.

Exceptions

2.70 For the cities of Kavaratti, Imphal, Anantnag and Port Blair, the valuation of FM Radio channels based on the above mentioned three methods do not provide reasonable and/or credible values. Therefore, the valuations for these cities are recommended as under:

(i) As per MIB reference, Kavaratti is a category 'D' city. However, Kavaratti, the capital of Lakshadweep, is an island city with a population of approximately 12000. Kavaratti is similar to the cities included in the 'Others' category. Therefore, the RP for Kavaratti ought to be set at Rs. 5 lakh.

(ii) Imphal is a city with (L, C) characteristics based on per capita GSDP and belongs to the NE. Out of 12 existing cities with (L, C) characteristics, only one city, Guwahati, is located in the NE. The reference price corresponding to (L, C) cell cannot be considered as a fair representative valuation of an FM Radio channel in Imphal. The reference price of Guwahati is 73% of the reference price of all the existing cities with (L, C). Applying a similar logic as used earlier, valuation of FM Radio channels in Imphal based on per capita GSDP is determined by multiplying the reference price of existing cities of (L,C) characteristics by a factor of 0.73. Similarly, the valuation of FM Radio channels in Imphal based on density of FM Radio receivers and per capita GR is determined by multiplying the reference price of existing cities with (S,C) characteristics by a factor of 0.57 and the reference price of existing cities with (H,C) characteristics by a factor of 0.63 respectively.

(iii) Port Blair is a category 'D' city based on population and is located in the UT of Andaman & Nicobar Islands, which is clubbed with WB for the purpose

of grouping only. WB is placed in second group in all three methods. However, looking at the economic activity level, Port Blair is similar to cities located in the NE States. Therefore, valuation for Port Blair is kept equivalent to category 'D' cities of NE. Similarly, valuation for Anantnag in J&K State is also kept equivalent to that for category 'D' cities of NE.

2.71 The final valuations of FM Radio channels in 253 new cities are given in **Annexure-XII**.

Estimation of Reserve Price for 253 new Cities

2.72 In the CP, it was proposed that the RP for FM channels in new cities can be set equal to 0.8 times of the derived valuations.

2.73 In response, some stakeholders did not agree with the proposal. One stakeholder suggested that reserve price for FM Radio channels in a new city should be set equal to 0.25 times of the valuation of FM Radio channels in that city. Another stakeholder stated that setting the RP at 80% of this final valuation, prima facie, seems logical.

2.74 In general, the RP should be set close to the expected valuation of a product. However, due to practical difficulties in determining the exact valuation of FM Radio channels, it is always better to estimate the valuation to the extent possible and then fix the RP so that there is scope for price discovery. If the RP for FM Radio channels in a new city is set at 0.25 times the valuation of FM Radio channels in that city, it would yield a very low RP which leaves open an opportunity for collusive bidding and a loss of revenue for the Government.

2.75 For the purpose of calculating the RP from the valuation of access spectrum used for telecommunication services, based on past domestic as well as international experience, the Authority considered a multiplication factor of 0.8 viz. the RP is set equal to the valuation of access spectrum multiplied

by 0.8. This has worked well till now. Therefore, the same multiplication factor of 0.8 has been used for estimating the RP for FM Radio channels in new cities. It would be the starting point for an ascending price auction. It will enable price discovery.

2.76 **The Authority recommends that RP for FM Radio channels in a new city is to be set equal to 0.8 times the valuation of FM Radio channels in that city.**

2.77 **The Authority recommends that the RPs in 253 new cities should be as given in Annexure-XII.**

Estimation of Reserve Price for Border (i.e. 'Others' Category) Cities

2.78 In the CP, it was proposed that for 11 new cities, classified in the 'Others' category, the RP be kept as Rs. 5 lakh. All stakeholders agree with the proposal. The Cabinet approved the RP for each of these 11 cities as Rs. 5 Lakhs. The Authority recognizes that these cities are of strategic importance. The availability of FM Radio broadcasting service in these far-flung areas can also be used for Emergency Warning Services (EWS) with the specific approval and guidance of the local district administration. When the RP (i.e. Rs. 5 Lakhs per city) set for these cities in Phase-III policy is compared with the proposed RPs for 'D' category cities of NE and J&K, it appears reasonable to encourage the participation of a large number of prospective bidders. The inherent design of an ascending e-auction process would anyway ensure that the true market value of the FM Radio channels in each city is discovered during the process of auction.

2.79 **The Authority recommends that the RPs in 11 border cities in the 'Others' category in Phase-III should be Rs. 5 lakh per channel.**

Chapter III
Summary of Recommendations

3.1 The Authority recommends that RP for FM Radio channels in a new city is to be set equal to 0.8 times the valuation of FM Radio channels in that city.

3.2 The Authority recommends that the RPs in 253 new cities should be as given in Annexure-XII.

3.3 The Authority recommends that the RPs in 11 border cities in the 'Others' category in Phase-III should be Rs. 5 lakh per channel.

List of Acronyms

Abbreviation	Description
AIR	All India Radio
CP	Consultation Paper
DoT	Department of Telecommunication
EWS	Emergency Warning Services
FM	Frequency Modulation
GDDP	Gross District Domestic Product
GOPA	Grant of Permission Agreement
GR	Gross Revenue
GSDP	Gross State Domestic Product
IRS	Indian Readership Survey
J&K	Jammu & Kashmir
MIB	Ministry of Information and Broadcasting
NOTEF	Non-refundable One Time Entry Fee
OTEF	One Time Entry Fee
RP	Reserve Price
TRAI	Telecom Regulatory Authority of India
UT	Union Territory

Annexure I

MIB reference dated 16th December 2014

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GOVERNMENT OF INDIA
MINISTRY OF
INFORMATION & BROADCASTING
SHASTRI BHAWAN, NEW DELHI - 110001

D.O.No.N-38014/10/2014-FM/1003 Dated 16th December, 2014.

Dear Sir,

Please refer to your D.O. No.23-3/2014-B&CS dated 20.11.2014 on FM Radio Phase-III Auctions.

2. TRAI vide their recommendations dated 20.02.2014 and subsequent clarification dated 5th September, 2014 had recommended that the methodology for determining the reserve price of fresh cities in Phase-III should be reconsidered as the current methodology might jeopardize the auction. The 2011 census data on population is to be applicable on the fresh FM Radio Phase-III cities. As per the recommendations of the AS&FA, MIB's Committee report dated 31.10.2014, Ministry is agreeable to include 37 fresh cities on the basis of the 2011 census data as it will lead to achieving the objective of FM radio broadcast services in uncovered geographical areas. So the total number of fresh cities becomes 227+37=264 cities.

3. As regards the existing 86 cities where 243 numbers of channels are operational, the amount of migration fee to be charged from these operators for migration from Phase-II to Phase-III has been already recommended by TRAI and has been accepted by the Government. As per Cabinet decision dated 7th July, 2011, 19 cities out of 86 cities have no vacant channels available for auction. In the remaining 67 cities, the reserve price for the 132 vacant channels has been approved by the Cabinet vide its decision 7th July, 2011. It is presumed that TRAI has nothing to add on reserve price, as approved by Cabinet on 7.7.2011, of vacant channels available in 67 existing cities.

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4. In respect of the TRAI recommendations regarding reduction of minimum channel spacing within a license service area to 400 Khz it is intimated that the IMC has accepted this recommendation in principle and it has been decided to declare this in the NIA document for Phase-III auction. This is in line with proposal of TRAI vide its letter dated 5th September, 2014.

5. Therefore, the authority is requested to kindly furnish their recommendations on reserve price for 264 (227+37) fresh cities, as per the Phase-III policy under Section 11(1) (a) of TRAI Act. The list of cities, category of city, along with number of channels, city-wise, is annexed.

6. Ministry of Information and Broadcasting is accordingly in the process of seeking Cabinet approval, inter-alia, for ascending e-auctions in the existing cities of Phase-II based on the reserve price formula approved by the Cabinet in 2011 and migration of existing Phase-II licenses to FM Phase-III on payment of migration fee as per migration formula recommended by TRAI in its recommendations dated 20.2.2014.

With Regards.

Yours Sincerely,

(Jitendra Shankar Mathur)

Encl: as above.

Shri Sudhir Gupta,
Secretary,
Telecom Regulatory Authority of India,
Mahanagar Door Sanchar Bhawan,
Jawaharlal Nehru Marg, (old Minto Road),
New Delhi-110002

Table-I :

(New Cities as per FM Phase-III Policy dated 25.07.2011)

S No	Name of City	State	Region	Channels available for phase -III
	a	b	c	d
	Category "B"			
1	**Dhanbad**	Jharkhand	E	4
2	**Ludhiana**	Punjab	N	4
3	**Moradabad**	Uttar Pradesh	N	4
	Category "C"			
4	**Alappuzha (Alleppey)**	Kerala	S	4
5	**Alwar**	Rajasthan	N	4
6	**Baharampur**	West Bengal	E	4
7	**Amravati**	Maharashtra	W	4
8	**Barddhaman**	West Bengal	E	4
9	**Belgaum**	Karnataka	S	4
10	**Bellary**	Karnataka	S	4
11	**Bhagalpur**	Bihar	E	4
12	**Bhavnagar**	Gujarat	W	4
13	**Bhilwara**	Rajasthan	N	4
14	**Bijapur**	Karnataka	S	4
15	**Brahmapur**	Orissa	E	4
16	**Dehradun**	Uttarakhand	N	4
17	**Devengeri**	Karnataka	S	4
18	**English Bazar (Maldah)**	West Bengal	E	4
19	**Erode**	Tamil Nadu	S	4
20	**Gaya**	Bihar	E	4
21	**Hubli-Dharwad**	Karnataka	S	4
22	**Imphal**	Manipur	E	4
23	**Jamnagar**	Gujarat	W	4
24	**Kakinada**	Andhra Pradesh	S	4
25	**Kurnool**	Andhra Pradesh	S	4
26	**Latur**	Maharashtra	W	4
27	**Malegaon**	Maharashtra	W	4
28	**Muzaffarnagar**	Uttar Pradesh	N	4
29	**Nellore**	Andhra Pradesh	S	4
30	**Nizamabad**	Telangana	S	4
31	**Purnia**	Bihar	E	4
32	**Sagar**	Madhya Pradesh	W	4
33	**Saharanpur**	Uttar Pradesh	N	4
34	**Salem**	Tamil Nadu	S	4
35	**Shahjahanpur**	Uttar Pradesh	N	4
36	**Shimoga**	Karnataka	S	4

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37	Ujjain	Madhya Pradesh	W	4
38	Vellore	Tamil nadu	S	4
S No	Name of City	State	Region	Channels available for phase -III
	a	b	c	d
Category "D"				
39	Abohar	Punjab	N	3
40	Achalpur	Maharashtra	W	3
41	Adilabad	Telangana	S	3
42	Adoni	Andhra Pradesh	S	3
43	Alipurduar	West Bengal	E	3
44	Alwal	Telangana	S	3
45	Ambala	Haryana	N	3
46	Anantpur	Andhra Pradesh	S	3
47	Arrah	Bihar	E	3
48	Azamgarh	Uttar Pradesh	N	3
49	Bahraich	Uttar Pradesh	N	3
50	Baleshwar	Orissa	E	3
51	Ballia	Uttar Pradesh	N	3
52	Balurghat	West Bengal	E	3
53	Bands	Uttar Pradesh	N	3
54	Bangaon	West Bengal	E	3
55	Bankura	West Bengal	E	3
56	Baripada	Orissa	E	3
57	Barshi	Maharashtra	W	3
58	Basti	Uttar Pradesh	N	3
59	Beawar	Rajasthan	N	3
60	Begusarai	Bihar	E	3
61	Bettiah	Bihar	E	3
62	Bhadurgarh	Haryana	N	3
63	Bharatpur	Rajasthan	N	3
64	Bharuch	Gujarat	W	3
65	Bhatinda	Punjab	N	3
66	Bheemavaram	Andhra Pradesh	S	3
67	Bhiwani	Haryana	N	3
68	Bidar	Karnataka	S	3
69	Bihar Shareef	Bihar	E	3
70	Bokaro Steel City	Jharkhand	E	3
71	Botad	Gujarat	W	3
72	Badaun	Uttar Pradesh	N	3

73	**Burhanapur**	Madhya Pradesh	W	3
74	**Chapra**	Bihar	E	3
75	**Chhattarpur**	Madhya Pradesh	W	3
76	**Chhindwara**	Madhya Pradesh	W	3
77	**Chikmagalur**	Karnataka	S	3
78	**Chirala**	Andhra Pradesh	S	3
79	**Chitradurga**	Karnataka	S	3
80	**Chittoor**	Andhra Pradesh	S	3
81	**Churu**	Rajasthan	N	3
82	**Coonoor**	Tamil Nadu	S	3
83	**Cuddapah**	Andhra Pradesh	S	3
84	**Daman***	Daman & Diu	W	3
85	**Damoh**	Madhya Pradesh	W	3
86	**Darbhanga**	Bihar	E	3
87	**Darjiling**	West Bengal	E	3
88	**Deoghar**	Jharkhand	E	3
89	**Deoria**	Uttar Pradesh	N	3
90	**Dharamavaram**	Andhra Pradesh	S	3
91	**Dibrugarh**	Assam	E	3
92	**Dimapur**	Nagaland	E	3
93	**Dingdigul**	Tamil Nadu	S	3
94	**Dohad**	Gujarat	W	3
95	**Durg-Bhillainagar**	Chhatisgarh	W	3
96	**Eluru**	Andhra Pradesh	S	3
97	**Etah**	Uttar Pradesh	N	3
98	**Etawah**	Uttar Pradesh	N	3
99	**Faizabad/Ayodhya**	Uttar Pradesh	N	3
100	**Farrukhabad cum Fatehgarh**	Uttar Pradesh	N	3
101	**Fatehpur**	Uttar Pradesh	N	3
102	**Gadag Betigeri**	Karnataka	S	3
103	**Ganganagar**	Rajasthan	N	3
104	**Ghazipur**	Uttar Pradesh	N	3
105	**Giridih**	Jharkhand	E	3
106	**Godhra**	Gujarat	W	3
107	**Gonda**	Uttar Pradesh	N	3
108	**Gondiya**	Maharashtra	W	3

109	**Guna**	Madhya Pradesh	W	3
110	**Guntakal**	Andhra Pradesh	S	3
111	**Haldwani-cum Kathgodam**	Uttarakhand	N	3
112	**Hanumangarh**	Rajasthan	N	3
113	**Hardoi**	Uttar Pradesh	N	3
114	**Hardwar**	Uttarakhand	N	3
115	**Hassan**	Karnataka	S	3
116	**Hazaribag**	Jharkhand	E	3
117	**Hindupur**	Andhra Pradesh	S	3
118	**Hoshiarpur**	Punjab	N	3
119	**Hospet**	Karnataka	S	3
120	**Itarsi**	Madhya Pradesh	W	3
121	**Jagdalpur**	Chhatisgarh	W	3
122	**Jaunpur**	Uttar Pradesh	N	3
123	**Jetpur Navagadh**	Gujarat	W	3
124	**Jhunjhunun**	Rajasthan	N	3
125	**Jind**	Haryana	N	3
126	**Jorhat**	Assam	E	3
127	**Junagadh**	Gujarat	W	3
128	**Kaithal**	Haryana	N	3
129	**Kanhangad (Kasargod)**	Kerala	S	3
130	**Karaikkudi**	Tamil Nadu	S	3
131	**Karimnagar**	Telangana	S	3
132	**Karur**	Tamil Nadu	S	3
133	**Kavarati**	Lakshadweep	S	3
134	**Khammam**	Telangana	S	3
135	**Khandwa**	Madhya Pradesh	W	3
136	**Kharagpur**	West Bengal	E	3
137	**Khargone**	Madhya Pradesh	W	3
138	**Kohima**	Nagaland	E	3
139	**Kolar**	Karnataka	S	3
140	**Korba**	Chhatisgarh	W	3
141	**Kothagudem**	Telangana	S	3
142	**Krishnanagar**	West Bengal	E	3
143	**Lakhimpur**	Uttar Pradesh	N	3
144	**Lalitpur**	Uttar Pradesh	N	3

145	**Machillpatnam**	Andhra Pradesh	S	3
146	**Madanapalle**	Andhra Pradesh	S	3
147	**Mahbubnagar**	Telangana	S	3
148	**Mahesana**	Gujarat	W	3
149	**Mainpuri**	Uttar Pradesh	N	3
150	**Mancherial**	Telangana	S	3
151	**Mandsaur**	Madhya Pradesh	W	3
152	**Mathura**	Uttar Pradesh	N	3
153	**Maunath Bhajan (Distt. Mau)**	Uttar Pradesh	N	3
154	**Mirzapur cum Vindhyachal**	Uttar Pradesh	N	3
155	**Moga**	Punjab	N	3
156	**Motihari**	Bihar	E	3
157	**Munger**	Bihar	E	3
158	**Murwara (Katni)**	Madhya Pradesh	W	3
159	**Nagaon (Nowgang)**	Assam	E	3
160	**Nagarcoil/Kanyakumari**	Tamil Nadu	S	3
161	**Nalgonda**	Telangana	S	3
162	**Nandyal**	Andhra Pradesh	S	3
163	**Neemuch**	Madhya Pradesh	W	3
164	**Neyveli**	Tamil Nadu	S	3
165	**Ongole**	Andhra Pradesh	S	3
166	**Orai**	Uttar Pradesh	N	3
167	**Palakkad**	Kerala	S	3
168	**Palanpur**	Gujarat	W	3
169	**Pali**	Rajasthan	N	3
170	**Panipat**	Haryana	N	3
171	**Patan**	Gujarat	W	3
172	**Pathankot**	Punjab	N	3
173	**Porbandar**	Gujarat	W	3
174	**Portblair**	Andman & Nikobar	E	3
175	**Proddatur**	Andhra Pradesh	S	3
176	**Pudukkottai**	Tamil Nadu	S	3
177	**Puri**	Orissa	E	3
178	**Puruliya**	West Bengal	E	3
179	**Rae Barelli**	Uttar Pradesh	N	3

180	**Raichur**	Karnataka	S	3
181	**Rajapalayam**	Tamil Nadu	S	3
182	**Rajgarh**	Chhatisgarh	W	3
183	**Ramagundam**	Telangana	S	3
184	**Raoganj**	West Bengal	E	3
185	**Ratlam**	Madhya Pradesh	W	3
186	**Rewa**	Madhya Pradesh	W	3
187	**Rewari**	Haryana	N	3
188	**Rohtak**	Haryana	N	3
189	**Saharsa**	Bihar	E	3
190	**Sambalpur**	Orissa	E	3
191	**Sasaram**	Bihar	E	3
192	**Satna**	Madhya Pradesh	W	3
193	**Sawai Madhopur**	Rajasthan	N	3
194	**Shivpuri**	Madhya Pradesh	W	3
195	**Sikar**	Rajasthan	N	3
196	**Silchar**	Assam	E	3
197	**Singrauli**	Madhya Pradesh	W	3
198	**Sirsa**	Haryana	N	3
199	**Sitapur**	Uttar Pradesh	N	3
200	**Siwan**	Bihar	E	3
201	**Sultanpur**	Uttar Pradesh	N	3
202	**Surendranagar Dudhrej**	Gujarat	W	3
203	**Thanesar**	Haryana	N	3
204	**Thanjavar**	Tamil Nadu	S	3
205	**Tinsukia**	Assam	E	3
206	**Tiruvannamlai**	Tamil Nadu	S	3
207	**Tonk**	Rajasthan	N	3
208	**Tumkur**	Karnataka	S	3
209	**Udupi**	Karnataka	S	3
210	**Vaniyambadi**	Tamil Nadu	S	3
211	**Veraval**	Gujarat	W	3
212	**Vidisha**	Madhya Pradesh	W	3
213	**Vizianagaram**	Andhra Pradesh	S	3
214	**Wadhwan (Surendernagar)**	Gujarat	W	3
215	**Wardha**	Maharashtra	W	3
216	**Yavatmal**	Maharashtra	W	3

S No	Name of City	State	Region	Channels available for phase -III
	a	b	c	d
Cities in Border Areas of J & K and NE states				
1	Kargil	J & K	N	3
2	Leh	J & K	N	3
3	Katua	J & K	N	3
4	Poonch	J & K	N	3
5	Bhaderwah	J & K	N	3
6	Dubhari	Assam	E	3
7	Haflong	Assam	E	3
8	Jowai	Meghalaya	E	3
9	Lung-lei	Mizoram	E	3
10	Mokukchung	Nagaland	E	3
11	Belonia	Tripura	E	3
		Sub total		33
227	TOTAL CHANNELS IN 227 NEW CITIES			719

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Table-II

New Additional Cities identified based on census 2011 figure

S No	Name of City	State	Region	Channels available for phase - III
	a	b	c	d
	Category "C"			
1	**Chandrapur**	Maharashtra	W	4
	Category "D"			
2	**Akbarpur**	Uttar Pradesh	N	3
3	**Ambikapur**	Chhatisgarh	W	3
4	**Amreli**	Gujarat	W	3
5	**Anantnag**	J&K	N	3
6	**Aurangabad**	Bihar	N	3
7	**Bagaha**	Bihar	N	3
8	**Bagalkot**	Karnataka	S	3
9	**Banswara**	Rajasthan	N	3
10	**Barnala**	Punjab	N	3
11	**Betul**	Madhya Pradesh	W	3
12	**Bhadrak**	Orissa	E	3
13	**Bhuj**	Gujarat	W	3
14	**Chilakaluripet**	Andhra Pradesh	S	3
15	**Chittaurgarh**	Rajasthan	N	3
16	**Dhulian**	West Bengal	E	3
17	**Dhaulpur**	Madhya Pradesh	W	3
18	**Firozpur**	Punjab	N	3
19	**Gandhidham**	Gujarat	W	3
20	**Hindaun**	Rajasthan	N	3
21	**Kishanganj**	Bihar	E	3
22	**Makrana**	Rajasthan	N	3
23	**Medini Nagar(Daltonganj)**	Jharkhand	E	3
24	**Muktsar**	Punjab	N	3

25	**Nagaur**	Rajasthan	N	3
26	**Nandurbar**	Maharashtra	W	3
27	**Narasaraopet**	Andhra Pradesh	S	3
28	**Osmanabad**	Maharashtra	W	3
29	**Seoni**	Madhya Pradesh	W	3
30	**Shikohabad**	Uttar Pradesh	N	3
31	**Sitamarhi**	Bihar	E	3
32	**Srikakulam**	Andhra Pradesh	S	3
33	**Sujangarh**	Rajasthan	N	3
34	**Suryapet**	Andhra Pradesh	S	3
35	**Tadpatri**	Andhra Pradesh	S	3
36	**Tezpur**	Assam	E	3
37	**Udgir**	Maharashtra	W	3
TOTAL CHANNELS IN 37 ADDITIONAL CITIES AS PER 2011 CENSUS				112

Annexure II

Grouping of States based on Per Capita GSDP

S.No.	State	Groups	Per Capita GSDP in thousands (Rs.) (2011-12)
1	Haryana	J	120.5
2	Maharashtra	J	106.7
3	Gujarat[$]	J	101.2
4	Kerala[@]	J	94.4
5	Uttarakhand	J	93.4
6	Punjab	J	93.0
7	Himachal Pradesh	J	93.0
8	Tamil Nadu	J	92.2
9	Andhra Pradesh	K	77.5
10	Karnataka	K	75.4
11	Rajasthan	K	60.8
12	WB[#]	K	59.1
13	Chhattisgarh	K	54.6
14	Jammu & Kashmir	L	52.1
15	Odisha	L	51.4
16	NE*	L	45.3
17	Jharkhand	L	43.1
18	Madhya Pradesh	L	42.6
19	Uttar Pradesh	L	34.0
20	Bihar	L	23.7

Group J - States with more than 25% of the mean value of per Capita GSDP
Group K - States with ± 25% of the mean value of per Capita GSDP
Group L - States with less than -25% of the mean value of per Capita GSDP

*** NE includes States of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura**

 # WB includes States West Bengal and Sikkim and UT of Andaman & Nicobar

$ Gujarat includes UT of Daman & Diu

@ Kerala includes UT of Lakshadweep

Annexure III

Grouping of States based on per capita Gross Revenue

S. No.	State	Groups	Per capita GR
1	Maharashtra	F	23.95
2	Karnataka	F	18.15
3	Tamil Nadu	F	17.87
4	Kerala[@]	F	14.82
5	Gujarat[$]	F	13.74
6	Andhra Pradesh	G	8.47
7	Punjab	G	8.29
8	Haryana[%]	G	2.56
9	WB[#]	G	7.80
10	Rajasthan	G	6.14
11	Himachal Pradesh	G	5.90
12	Madhya Pradesh	G	5.67
13	Jammu & Kashmir	H	4.11
14	Chhattisgarh	H	3.84
15	Jharkhand	H	3.48
16	Uttar Pradesh	H	3.38
17	Orissa	H	2.18
18	Bihar	H	1.37
19	NE*	H	0.29

Group F - States with more than 25% of the mean value of per capita Gross Revenue

Group G - States with ± 25% of the mean value of per capita Gross Revenue

Group H - States with less than -25% of the mean value of per capita Gross Revenue

*** NE includes North Eastern States of Arunachal Pradesh, Assam, Meghalaya, Mizoram & Tripura**

 # WB includes States West Bengal and Sikkim

$ Gujarat includes UT of Daman & Diu

@ Kerala includes UT of Lakshadweep

% Haryana has been put into a category where Punjab is categorised. This is because of the fact that a few important cities of Haryana (like Gurgaon, Faridabad, Panchkula etc.), having significant revenue generation potential, are actually covered by the FM Radio stations located within the boundaries of the neighbouring States/ UTs.

Annexure IV

Grouping of States based on density of FM Radio receivers

S.No.	State	Groups	Density of FM Radio receivers
1	Himachal Pradesh	Q	128.96
2	Tamil Nadu	Q	121.77
3	Punjab	Q	115.27
4	Kerala[@]	Q	112.37
5	Uttarakhand[%]	Q	66.73
6	Karnataka	R	101.70
7	Maharashtra	R	100.27
8	Gujarat[$]	R	96.64
9	Haryana	R	96.47
10	WB[#]	R	83.57
11	Andhra Pradesh	R	82.90
12	Rajasthan	R	76.66
13	Odisha	R	68.85
14	Jammu & Kashmir	R	67.88
15	Uttar Pradesh	R	66.04
16	NE*	S	59.35
17	Madhya Pradesh	S	57.09
18	Chhattisgarh	S	56.32
19	Jharkhand	S	54.83
20	Bihar	S	54.48

Group Q - States with more than 25% of the mean value of density of FM Radio receivers

Group R - States with ± 25% of the mean value of density of FM Radio receivers

Group S - States with less than -25% of the mean value of density of FM Radio receivers

*** NE includes States of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland & Tripura**

 # WB includes States West Bengal and Sikkim and UT of Andaman & Nicobar

$ Gujarat includes UT of Daman & Diu

@ Kerala includes UT of Lakshadweep

% Uttarakhand has been put into a group where Himachal Pradesh is placed. This is because of the fact that mobile subscribers of Uttarakhand have been clubbed with the mobile subscribers of Uttar Pradesh and Uttarakhand has a geographical terrain similar to that of Himachal Pradesh.

Annexure V

Grouping of existing cities based on the per capita GSDP and population

City category (based on population) / State category (based per capita GSDP)	B	C	D
J	Amritsar, Coimbatore, Kochi, Madurai, Rajkot, Vadodra,	Ahmednagar, Akola, Aurangabad, Dhule, Jalandhar, Jalgaon, Kannur, Kolhapur, Kozhikode, Nanded, Nasik, Patiala, Sangli, Sholapur, Thiruvananthapuram, Thrissur, Tirunelveli, Trichy, Tuticorin	Hissar, Karnal, Shimla
K	Asansol, Vijayawada, Vishakhapatnam	Ajmer, Bilaspur, Bikaner, Gulbarga, Jodhpur, Kota, Mysore, Mangalore, Rajahmundry, Raipur, Siliguri, Tirupati, Udaipur, Warrangal,	Gangtok
L	Agra, Allahabad, Bhopal, Indore, Jabalpur, Jamshedpur, Patna, Varanasi	Aligarh, Bareilly, Bhubaneshwar, Gorakhpur, Guwahati, Gwalior, Jammu, Jhansi, Muzaffarpur, Ranchi, Rourkela, Srinagar	Agartala, Aizwal, Itanagar, Shillong

Annexure VI

Groups of existing cities based on the per capita GR and population

City category (based on population) / State category (based on per capita GR)	B	C	D
F	Coimbatore, Kochi, Madurai, Rajkot, Vadodra	Ahmednagar, Akola, Aurangabad, dhule, Gulbarga, Jalgaon, Kannur, Kolhapur, Kozhikode, Mangalore, Mysore, Nanded, Nasik, sangli, Sholapur, Thiruvananthapuram, Thrissur, Tirunelvli, Trichy, Tuticorin	
G	Amritsar, Asansol, Jamshedpur, Vijayawada, Vishakapatnam.	Ajmer, Bikaner, Jalandhar, Jodhpur, Kota, Patiala, Rajahmundry, Ranchi, Siliguri, Tirupati, Udaipur, Warrangal	Gangtok, Hissar, Karnal, Shimla
H	Agra, Allahabad, Bhopal, Indore, Jabalpur, patna, Varansi	Aligarh, Bareily, Bhubaneshwar, Bilaspur, Gorakhpur, Guwahati, Gwalior, Jammu, Jhansi, Muzaffarpur, Raipur, Rourkela, Srinagar	Agartala, Aizwal, Itanagar, Shillong

Annexure VII

Grouping of existing cities based on density of FM Radio receivers and population

City category (based on population) / State Category (based on density of FM Radio receivers)	B	C	D
Q	Kochi, Amritsar, Coimbatore, Madurai	Kannur, Kozhikode, Thiruvananthapuram, Thrissur, Jalandhar, Patiala, Tirunelveli, Trichy, Tuticorin	Shimla
R	Vijayawada, Vishakapatnam, Rajkot, Vadodra Asansol, Agra, Allahabad, Varanasi	Rajahmundry, Tirupati, Warrangal, Gulbarga, Mangalore, Mysore, Ahmednagar, Akola, Aurangabad, Dhule, Jalgaon, Kolhapur, Nanded, Nasik, Sangli, Sholapur, Ajmer, Bikaner, Jodhpur, Kota, Udaipur, Siliguri, Jammu, Srinagar, Bhubaneshwar, Rourkela, Aligarh, Bareily, Gorakhpur, Jhansi	Hissar, Karnal, Gangtok
S	Patna, Jamshedpur, Bhopal, Indore, Jabalpur	Guwahati, Muzaffarpur, Bilaspur, Raipur, Ranchi, Gwalior	Itanagar, Shillong, Aizwal, Agartala

Annexure VIII

Indexed reference prices derived from successful Bids for Phase-II FM Channels

S. No.	Name of City	State	City Category as per Phase-III policy	Bid 1 (Rs.)	Bid 2 (Rs.)	Bid 3 (Rs.)	Bid 4 (Rs.)	Total of successful bids received (Rs.)	Average of successful bids received (a) (Rs.)	Average of successful bids with permission period indexation b=1.5 x a (Rs.)	Reference price (Average of successful bids after Inflation indexation) c = 1.798 x b (Rs.)
1	Agartala	Tripura	D	16,20,000	12,07,000	11,70,090		39,97,090	13,32,363	19,98,545	35,93,384
2	Agra	Uttar Pradesh	B	2,56,00,050	2,51,10,090	2,50,00,000		7,57,10,140	2,52,36,713	3,78,55,070	6,80,63,416
3	Ahmednagar	Maharashtra	C	37,60,000	36,59,000	32,20,000		1,06,39,000	35,46,333	53,19,500	95,64,461
4	Aizwal	Mizoram	D	12,07,000	5,58,090			17,65,090	8,82,545	13,23,818	23,80,224
5	Ajmer	Rajasthan	C	76,00,000	35,00,000	31,00,000	27,00,090	1,69,00,090	42,25,023	63,37,534	1,13,94,886
6	Akola	Maharashtra	C	29,59,000	18,00,000	15,10,000		62,69,000	20,89,667	31,34,500	56,35,831
7	Aligarh	Uttar Pradesh	C	31,00,000	27,00,090			58,00,090	29,00,045	43,50,068	78,21,421
8	Allahabad	Uttar Pradesh	B	2,10,00,000	76,00,590	64,00,000		3,50,00,590	1,16,66,863	1,75,00,295	3,14,65,530
9	Amritsar	Punjab	B	3,00,00,000	1,63,00,000	1,62,00,000	1,61,10,090	7,86,10,090	1,96,52,523	2,94,78,784	5,30,02,853
10	Asansol	West Bengal	B	1,94,05,000	76,50,090			2,70,55,090	1,35,27,545	2,02,91,318	3,64,83,789
11	Aurangabad	Maharashtra	C	2,99,00,000	1,25,59,000			4,24,59,000	2,12,29,500	3,18,44,250	5,72,55,962
12	Bareily	Uttar Pradesh	C	31,00,000	27,00,090	27,00,000		85,00,090	28,33,363	42,50,045	76,41,581
13	Bhopal	Madhya Pradesh	B	2,99,00,000	2,98,00,000	2,52,00,990	2,50,59,000	10,99,59,990	2,74,89,998	4,12,34,996	7,41,40,523
14	Bhubaneshwar	Odisha	C	79,00,000	61,20,090	46,55,000		1,86,75,090	62,25,030	93,37,545	1,67,88,906
15	Bikaner	Rajasthan	C	31,00,000	27,00,090			58,00,090	29,00,045	43,50,068	78,21,421
16	Bilaspur	Chhattisgrah	C	32,15,000	31,50,990	21,59,000	15,05,002	1,00,29,992	25,07,498	37,61,247	67,62,722
17	Coimbatore	Tamil Nadu	B	6,73,00,000	6,30,00,000	6,12,00,000		19,15,00,000	6,38,33,333	9,57,50,000	17,21,58,500
18	Dhule	Maharashtra	C	46,59,000	21,60,000			68,19,000	34,09,500	51,14,250	91,95,422
19	Gangtok	Sikkim	D	31,00,000	12,07,000	11,70,090	10,00,101	64,77,191	16,19,298	24,28,947	43,67,246
20	Gorakhpur	Uttar Pradesh	C	31,00,000	21,60,090	18,00,000		70,60,090	23,53,363	35,30,045	63,47,021
21	Gulbarga	Karnataka	C	1,50,05,000	51,00,900			2,01,05,900	1,00,52,950	1,50,79,425	2,71,12,806
22	Guwahati	Assam	C	37,80,090	30,50,000	28,06,000	26,55,000	1,22,91,090	30,72,773	46,09,159	82,87,267
23	Gwalior	Madhya Pradesh	C	86,51,000	67,14,000	66,59,000	51,30,990	2,71,54,990	67,88,748	1,01,83,121	1,83,09,252
24	Hissar	Haryana	D	61,10,000	50,04,400	27,00,090	27,00,000	1,65,14,490	41,28,623	61,92,934	1,11,34,895
25	Indore	Madhya Pradesh	B	5,21,20,890	5,03,00,000	4,01,00,000		14,25,20,890	4,75,06,963	7,12,60,445	12,81,26,280

26	Itanagar	Arunachal Pradesh	D	13,03,000	12,07,000	5,58,090		30,68,090	10,22,697	15,34,045	27,58,213
27	Jabalpur	Madhya Pradesh	B	1,51,59,000	1,35,00,000	1,27,12,000	61,20,000	4,74,91,000	1,18,72,750	1,78,09,125	3,20,20,807
28	Jalandhar	Punjab	C	2,61,00,090	2,29,00,000	2,25,00,000	2,10,00,000	9,25,00,090	2,31,25,023	3,46,87,534	6,23,68,186
29	Jalgaon	Maharashtra	C	36,59,000	31,60,000	22,00,000	15,00,100	1,05,19,100	26,29,775	39,44,663	70,92,503
30	Jammu	J&K	C	1,01,07,090				1,01,07,090	1,01,07,090	1,51,60,635	2,72,58,822
31	Jamshedpur	Jharkhand	B	1,21,50,990	76,10,000	52,55,000		2,50,15,990	83,38,663	1,25,07,995	2,24,89,375
32	Jhansi	Uttar Pradesh	C	31,00,000	27,00,090			58,00,090	29,00,045	43,50,068	78,21,421
33	Jodhpur	Rajasthan	C	1,27,00,000	1,14,00,000	1,08,00,000	1,01,07,090	4,50,07,090	1,12,51,773	1,68,77,659	3,03,46,030
34	Kannur	Kerala	C	2,50,20,000	1,76,04,000	75,02,135	75,00,000	5,76,26,135	1,44,06,534	2,16,09,801	3,88,54,422
35	Karnal	Haryana	D	90,00,000	71,10,000			1,61,10,000	80,55,000	1,20,82,500	2,17,24,335
36	Kochi	Kerala	B	10,11,69,990	9,60,00,000	9,01,20,011		28,72,90,001	9,57,63,334	14,36,45,001	25,82,73,711
37	Kolhapur	Maharashtra	C	3,51,00,000	91,00,000			4,42,00,000	2,21,00,000	3,31,50,000	5,96,03,700
38	Kota	Rajasthan	C	85,30,000	31,00,000	30,60,000	27,00,090	1,73,90,090	43,47,523	65,21,284	1,17,25,268
39	Kozhikode	Kerala	C	7,02,00,100	4,10,00,000			11,12,00,100	5,56,00,050	8,34,00,075	14,99,53,335
40	Madurai	Tamil Nadu	B	6,30,00,000	6,00,12,000	4,41,00,000		16,71,12,000	5,57,04,000	8,35,56,000	15,02,33,688
41	Mangalore	Karnataka	C	2,75,10,000	1,89,99,990	96,00,000	81,00,600	6,42,10,590	1,60,52,648	2,40,78,971	4,32,93,990
42	Muzaffarpur	Bihar	C	15,10,000	11,01,000	5,58,090		31,69,090	10,56,363	15,84,545	28,49,012
43	Mysore	Karnataka	C	3,21,30,990	3,01,01,000			6,22,31,990	3,11,15,995	4,66,73,993	8,39,19,839
44	Nanded	Maharashtra	C	29,59,000	15,01,000	10,00,000		54,60,000	18,20,000	27,30,000	49,08,540
45	Nasik	Maharashtra	C	3,51,00,000	2,60,59,000			6,11,59,000	3,05,79,500	4,58,69,250	8,24,72,912
46	Patiala	Punjab	C	1,10,00,000	1,08,00,000	81,10,000	54,00,090	3,53,10,090	88,27,523	1,32,41,284	2,38,07,828
47	Patna	Bihar	B	5,13,00,000				5,13,00,000	5,13,00,000	7,69,50,000	13,83,56,100
48	Raipur	Chhattisgrah	C	2,12,10,000	1,99,00,000	1,01,00,000	75,00,004	5,87,10,004	1,46,77,501	2,20,16,252	3,95,85,220
49	Rajahmundry	Andhra Pradesh	C	1,50,00,500	61,00,530			2,11,01,030	1,05,50,515	1,58,25,773	2,84,54,739
50	Rajkot	Gujarat	B	3,51,00,000	2,25,59,000	2,11,00,590		7,87,59,590	2,62,53,197	3,93,79,795	7,08,04,871
51	Ranchi	Jharkhand	C	64,10,000	37,80,990	37,60,000	36,99,999	1,76,50,989	44,12,747	66,19,121	1,19,01,179
52	Rourkela	Odisha	C	26,55,000	22,00,000	11,70,090		60,25,090	20,08,363	30,12,545	54,16,556
53	Sangli	Maharashtra	C	46,59,000	40,30,000			86,89,000	43,44,500	65,16,750	1,17,17,117
54	Shillong	Meghalaya	D	18,07,000	12,07,000	11,70,090		41,84,090	13,94,697	20,92,045	37,61,497
55	Shimla	Himachal Pradesh	D	1,26,00,000	81,10,000	51,30,090		2,58,40,090	86,13,363	1,29,20,045	2,32,30,241
56	Sholapur	Maharashtra	C	66,59,000	50,20,000	36,00,990		1,52,79,990	50,93,330	76,39,995	1,37,36,711
57	Siliguri	West Bengal	C	65,00,501	55,00,000	46,55,000	44,00,000	2,10,55,501	52,63,875	78,95,813	1,41,96,672
58	Srinagar	J&K	C	61,20,090				61,20,090	61,20,090	91,80,135	1,65,05,883
59	Thiruvananthapur	Kerala	C	5,00,00,500	3,48,89,999	3,24,00,000	3,21,30,990	14,94,21,489	3,73,55,372	5,60,33,058	10,07,47,439

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60	Thrissur	Kerala	C	3,48,89,999	2,50,00,500	1,76,04,000	1,10,00,000	8,84,94,499	2,21,23,625	3,31,85,437	5,96,67,416
61	Tiruchy	Tamil Nadu	C	5,00,00,500	3,15,00,000			8,15,00,500	4,07,50,250	6,11,25,375	10,99,03,424
62	Tirunelveli	Tamil Nadu	C	1,26,00,000	1,17,00,990	71,00,160		3,14,01,150	1,04,67,050	1,57,00,575	2,82,29,634
63	Tirupati	Andhra Pradesh	C	4,50,50,000	1,17,00,990			5,67,50,990	2,83,75,495	4,25,63,243	7,65,28,710
64	Tuticorin	Tamil Nadu	C	1,50,00,500	99,00,000	51,00,900		3,00,01,400	1,00,00,467	1,50,00,700	2,69,71,259
65	Udaipur	Rajasthan	C	1,01,07,090	52,10,000	31,00,000	30,60,000	2,14,77,090	53,69,273	80,53,909	1,44,80,928
66	Vadodra	Gujarat	B	4,51,00,890	3,51,00,000	2,80,60,000	2,80,59,000	13,63,19,890	3,40,79,973	5,11,19,959	9,19,13,686
67	Varanasi	Uttar Pradesh	B	2,10,00,000	1,26,00,000	1,08,00,000	64,00,000	5,08,00,000	1,27,00,000	1,90,50,000	3,42,51,900
68	Vijayawada	Andhra Pradesh	B	7,00,20,000	6,30,00,000			13,30,20,000	6,65,10,000	9,97,65,000	17,93,77,470
69	Vishakapatnam	Andhra Pradesh	B	4,66,00,000	4,11,39,990	3,24,00,000		12,01,39,990	4,00,46,663	6,00,69,995	10,80,05,851
70	Warrangal	Andhra Pradesh	C	1,25,25,000	41,00,460			1,66,25,460	83,12,730	1,24,69,095	2,24,19,433

Annexure IX

Existing Category 'B', 'C' & 'D' cities grouped based on per capita GSDP and category wise average of indexed reference prices

State	Name of Stations	Category As per Ph-III policy	Indexed reference price of existing cities Phase-II (Rs.)	Group based on per capita GSDP
Punjab	Amritsar	B	5,30,02,853	J
Tamil Nadu	Coimbatore	B	17,21,58,500	J
Kerala	Kochi	B	25,82,73,711	J
Tamil Nadu	Madurai	B	15,02,33,688	J
Gujarat	Rajkot	B	7,08,04,871	J
Gujarat	Vadodra	B	9,19,13,686	J
		B Average	13,27,31,218	
Maharashtra	Ahmednagar	C	95,64,461	J
Maharashtra	Akola	C	56,35,831	J
Maharashtra	Aurangabad	C	5,72,55,962	J
Maharashtra	Dhule	C	91,95,422	J
Punjab	Jalandhar	C	6,23,68,186	J
Maharashtra	Jalgaon	C	70,92,503	J
Kerala	Kannur	C	3,88,54,422	J
Maharashtra	Kolhapur	C	5,96,03,700	J
Kerala	Kozhikode	C	14,99,53,335	J
Maharashtra	Nanded	C	49,08,540	J
Maharashtra	Nasik	C	8,24,72,912	J
Punjab	Patiala	C	2,38,07,828	J
Maharashtra	Sangli	C	1,17,17,117	J
Maharashtra	Sholapur	C	1,37,36,711	J
Kerala	Thiruvananthapuram	C	10,07,47,439	J
Kerala	Thrissur	C	5,96,67,416	J
Tamil Nadu	Tirunelveli	C	2,82,29,634	J
Tamil Nadu	Trichy	C	10,99,03,424	J
Tamil Nadu	Tuticorin	C	2,69,71,259	J
		C Average	4,53,51,900	
Haryana	Hissar	D	1,11,34,895	J
Haryana	Karnal	D	2,17,24,335	J
Himachal Pradesh	Shimla	D	2,32,30,241	J
		D Average	1,86,96,490	
West Bengal	Asansol	B	3,64,83,789	K
Andhra Pradesh	Vijayawada	B	17,93,77,470	K
Andhra Pradesh	Vishakapatnam	B	10,80,05,851	K
		B Average	10,79,55,703	

Rajasthan	Ajmer	C	1,13,94,886	K
Rajasthan	Bikaner	C	78,21,421	K
Chhattisgrah	Bilaspur	C	67,62,722	K
Karnataka	Gulbarga	C	2,71,12,806	K
Rajasthan	Jodhpur	C	3,03,46,030	K
Rajasthan	Kota	C	1,17,25,268	K
Karnataka	Mangalore	C	4,32,93,990	K
Karnataka	Mysore	C	8,39,19,839	K
Chhattisgrah	Raipur	C	3,95,85,220	K
Andhra Pradesh	Rajahmundry	C	2,84,54,739	K
West Bengal	Siliguri	C	1,41,96,672	K
Andhra Pradesh	Tirupati	C	7,65,28,710	K
Rajasthan	Udaipur	C	1,44,80,928	K
Andhra Pradesh	Warrangal	C	2,24,19,433	K
		C Average	2,98,60,190	
Sikkim	Gangtok	D	43,67,246	K
		D Average	43,67,246	
Uttar Pradesh	Agra	B	6,80,63,416	L
Uttar Pradesh	Allahabad	B	3,14,65,530	L
Madhya Pradesh	Bhopal	B	7,41,40,523	L
Madhya Pradesh	Indore	B	12,81,26,280	L
Madhya Pradesh	Jabalpur	B	3,20,20,807	L
Jharkhand	Jamshedpur	B	2,24,89,375	L
Bihar	Patna	B	13,83,56,100	L
Uttar Pradesh	Varanasi	B	3,42,51,900	L
		B Average	6,61,14,241	
Uttar Pradesh	Aligarh	C	78,21,421	L
Uttar Pradesh	Bareily	C	76,41,581	L
Odisha	Bhubaneshwar	C	1,67,88,906	L
Uttar Pradesh	Gorakhpur	C	63,47,021	L
Assam	Guwahati	C	82,87,267	L
Madhya Pradesh	Gwalior	C	1,83,09,252	L
J&K	Jammu	C	2,72,58,822	L
Uttar Pradesh	Jhansi	C	78,21,421	L
Bihar	Muzaffarpur	C	28,49,012	L
Jharkhand	Ranchi	C	1,19,01,179	L
Odisha	Rourkela	C	54,16,556	L
J&K	Srinagar	C	1,65,05,883	L
		C Average	1,14,12,360	
Tripura	Agartala	D	35,93,384	L
Mizoram	Aizwal	D	23,80,224	L
Arunachal Pradesh	Itanagar	D	27,58,213	L
Meghalaya	Shillong	D	37,61,497	L
		D Average	31,23,329	

Annexure X

Existing Category 'B', 'C' & 'D' cities grouped based on per capita GR and category wise average of indexed reference prices

State	Name of Stations	Category as per Ph-III policy	Indexed reference price of existing cities Phase-II (Rs.)	Group based per capita GR
Tamil Nadu	Coimbatore	B	17,21,58,500	F
Kerala	Kochi	B	25,82,73,711	F
Tamil Nadu	Madurai	B	15,02,33,688	F
Gujarat	Rajkot	B	7,08,04,871	F
Gujarat	Vadodra	B	9,19,13,686	F
		B Average	14,86,76,891	
Maharashtra	Ahmednagar	C	95,64,461	F
Maharashtra	Akola	C	56,35,831	F
Maharashtra	Aurangabad	C	5,72,55,962	F
Maharashtra	Dhule	C	91,95,422	F
Karnataka	Gulbarga	C	2,71,12,806	F
Maharashtra	Jalgaon	C	70,92,503	F
Kerala	Kannur	C	3,88,54,422	F
Maharashtra	Kolhapur	C	5,96,03,700	F
Kerala	Kozhikode	C	14,99,53,335	F
Karnataka	Mangalore	C	4,32,93,990	F
Karnataka	Mysore	C	8,39,19,839	F
Maharashtra	Nanded	C	49,08,540	F
Maharashtra	Nasik	C	8,24,72,912	F
Maharashtra	Sangli	C	1,17,17,117	F
Maharashtra	Sholapur	C	1,37,36,711	F
Kerala	Thiruvananthapuram	C	10,07,47,439	F
Kerala	Thrissur	C	5,96,67,416	F
Tamil Nadu	Tirunelveli	C	2,82,29,634	F
Tamil Nadu	Trichy	C	10,99,03,424	F
Tamil Nadu	Tuticorin	C	2,69,71,259	F
		C Average	4,64,91,836	
Punjab	Amritsar	B	5,30,02,853	G
West Bengal	Asansol	B	3,64,83,789	G
Jharkhand	Jamshedpur	B	2,24,89,375	G
Andhra Pradesh	Vijayawada	B	17,93,77,470	G
Andhra Pradesh	Vishakapatnam	B	10,80,05,851	G
		B Average	7,98,71,868	
Rajasthan	Ajmer	C	1,13,94,886	G

Rajasthan	Bikaner	C	78,21,421	G
Punjab	Jalandhar	C	6,23,68,186	G
Rajasthan	Jodhpur	C	3,03,46,030	G
Rajasthan	Kota	C	1,17,25,268	G
Punjab	Patiala	C	2,38,07,828	G
Andhra Pradesh	Rajahmundry	C	2,84,54,739	G
Jharkhand	Ranchi	C	1,19,01,179	G
West Bengal	Siliguri	C	1,41,96,672	G
Andhra Pradesh	Tirupati	C	7,65,28,710	G
Rajasthan	Udaipur	C	1,44,80,928	G
Andhra Pradesh	Warrangal	C	2,24,19,433	G
		C Average	2,62,87,107	
Sikkim	Gangtok	D	43,67,246	G
Haryana	Hissar	D	1,11,34,895	G
Haryana	Karnal	D	2,17,24,335	G
Himachal Pradesh	Shimla	D	2,32,30,241	G
		D Average	1,51,14,179	
Uttar Pradesh	Agra	B	6,80,63,416	H
Uttar Pradesh	Allahabad	B	3,14,65,530	H
Madhya Pradesh	Bhopal	B	7,41,40,523	H
Madhya Pradesh	Indore	B	12,81,26,280	H
Madhya Pradesh	Jabalpur	B	3,20,20,807	H
Bihar	Patna	B	13,83,56,100	H
Uttar Pradesh	Varanasi	B	3,42,51,900	H
		B Average	7,23,46,365	
Uttar Pradesh	Aligarh	C	78,21,421	H
Uttar Pradesh	Bareily	C	76,41,581	H
Odisha	Bhubaneshwar	C	1,67,88,906	H
Chhattisgrah	Bilaspur	C	67,62,722	H
Uttar Pradesh	Gorakhpur	C	63,47,021	H
Assam	Guwahati	C	82,87,267	H
Madhya Pradesh	Gwalior	C	1,83,09,252	H
J&K	Jammu	C	2,72,58,822	H
Uttar Pradesh	Jhansi	C	78,21,421	H
Bihar	Muzaffarpur	C	28,49,012	H
Chhattisgrah	Raipur	C	3,95,85,220	H
Odisha	Rourkela	C	54,16,556	H
J&K	Srinagar	C	1,65,05,883	H
		C Average	1,31,84,237	
Tripura	Agartala	D	35,93,384	H
Mizoram	Aizwal	D	23,80,224	H
Arunachal Pradesh	Itanagar	D	27,58,213	H
Meghalaya	Shillong	D	37,61,497	H
		D Average	31,23,329	

Annexure XI

Existing Category 'B', 'C' & 'D' cities grouped based on density of FM Radio receivers and category wise average of indexed reference prices

State	Name of City	City Category as per Ph-III policy	Indexed reference price of existing cities Phase-II (Rs.)	Group based on FM Radio receiver density
Punjab	Amritsar	B	5,30,02,853	Q
Tamil Nadu	Coimbatore	B	17,21,58,500	Q
Kerala	Kochi	B	25,82,73,711	Q
Tamil Nadu	Madurai	B	15,02,33,688	Q
		B Average	15,84,17,188	
Punjab	Jalandhar	C	6,23,68,186	Q
Kerala	Kannur	C	3,88,54,422	Q
Kerala	Kozhikode	C	14,99,53,335	Q
Punjab	Patiala	C	2,38,07,828	Q
Kerala	Thiruvananthapuram	C	10,07,47,439	Q
Kerala	Thrissur	C	5,96,67,416	Q
Tamil Nadu	Tirunelveli	C	2,82,29,634	Q
Tamil Nadu	Trichy	C	10,99,03,424	Q
Tamil Nadu	Tuticorin	C	2,69,71,259	Q
		C Average	6,67,22,549	
Himachal Pradesh	Shimla	D	2,32,30,241	Q
		D Average	2,32,30,241	
Uttar Pradesh	Agra	B	6,80,63,416	R
Uttar Pradesh	Allahabad	B	3,14,65,530	R
West Bengal	Asansol	B	3,64,83,789	R
Gujarat	Rajkot	B	7,08,04,871	R
Gujarat	Vadodra	B	9,19,13,686	R
Uttar Pradesh	Varanasi	B	3,42,51,900	R
Andhra Pradesh	Vijayawada	B	17,93,77,470	R
Andhra Pradesh	Vishakapatnam	B	10,80,05,851	R
		B Average	7,75,45,814	
Maharashtra	Ahmednagar	C	95,64,461	R
Rajasthan	Ajmer	C	1,13,94,886	R
Maharashtra	Akola	C	56,35,831	R
Uttar Pradesh	Aligarh	C	78,21,421	R
Maharashtra	Aurangabad	C	5,72,55,962	R
Uttar Pradesh	Bareily	C	76,41,581	R
Odisha	Bhubaneshwar	C	1,67,88,906	R

Rajasthan	Bikaner	C	78,21,421	R
Maharashtra	Dhule	C	91,95,422	R
Uttar Pradesh	Gorakhpur	C	63,47,021	R
Karnataka	Gulbarga	C	2,71,12,806	R
Maharashtra	Jalgaon	C	70,92,503	R
J&K	Jammu	C	2,72,58,822	R
Uttar Pradesh	Jhansi	C	78,21,421	R
Rajasthan	Jodhpur	C	3,03,46,030	R
Maharashtra	Kolhapur	C	5,96,03,700	R
Rajasthan	Kota	C	1,17,25,268	R
Karnataka	Mangalore	C	4,32,93,990	R
Karnataka	Mysore	C	8,39,19,839	R
Maharashtra	Nanded	C	49,08,540	R
Maharashtra	Nasik	C	8,24,72,912	R
Andhra Pradesh	Rajahmundry	C	2,84,54,739	R
Odisha	Rourkela	C	54,16,556	R
Maharashtra	Sangli	C	1,17,17,117	R
Maharashtra	Sholapur	C	1,37,36,711	R
West Bengal	Siliguri	C	1,41,96,672	R
J&K	Srinagar	C	1,65,05,883	R
Andhra Pradesh	Tirupati	C	7,65,28,710	R
Rajasthan	Udaipur	C	1,44,80,928	R
Andhra Pradesh	Warrangal	C	2,24,19,433	R
		C Average	2,42,82,650	
Sikkim	Gangtok	D	43,67,246	R
Haryana	Hissar	D	1,11,34,895	R
Haryana	Karnal	D	2,17,24,335	R
		D Average	1,24,08,825	
Madhya Pradesh	Bhopal	B	7,41,40,523	S
Madhya Pradesh	Indore	B	12,81,26,280	S
Madhya Pradesh	Jabalpur	B	3,20,20,807	S
Jharkhand	Jamshedpur	B	2,24,89,375	S
Bihar	Patna	B	13,83,56,100	S
		B Average	7,90,26,617	
Chhattisgrah	Bilaspur	C	67,62,722	S
Assam	Guwahati	C	82,87,267	S
Madhya Pradesh	Gwalior	C	1,83,09,252	S
Bihar	Muzaffarpur	C	28,49,012	S
Chhattisgrah	Raipur	C	3,95,85,220	S
Jharkhand	Ranchi	C	1,19,01,179	S
		C Average	1,46,15,775	
Tripura	Agartala	D	35,93,384	S
Mizoram	Aizawl	D	23,80,224	S

Arunachal Pradesh	Itanagar	D	27,58,213	S
Meghalaya	Shillong	D	37,61,497	S
		D Average	31,23,329	

Annexure XII

Reserve prices for 253 new cities

S. No.	Name of City	State	Category as per Phase-III Policy	Group based on density of FM Radio receivers	Group based on per capita GSDP	Group based on per capita GR	Valuation based on density of FM Radio receivers (Rs.) (a)	Valuation based on per capita GSDP (Rs.) (b)	Valuation based on per capita GR (Rs.) (c)	Valuation as mean value of (a), (b) & (c) (Rs.) (d)	Reserve Price as 0.8 times of valuation (e=d x 0.8) (Rs. In lakh)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1	Abohar	Punjab	D	Q	J	G		187	151	169	135
2	Achalpur	Maharashtra	D	R	J	F	124	187		156	124
3	Adilabad	Telangana	D	R	K	G	124		151	138	110
4	Adoni	Andhra Pradesh	D	R	K	G	124		151	138	110
5	Akbarpur	Uttar Pradesh	D	R	L	H	124	43	50	72	58
6	Alappuzha (Alleppey)	Kerala	C	Q	J	F	667	454	465	529	423
7	Alipurduar	West Bengal	D	R	K	G	124		151	138	110
8	Alwal	Telangana	D	R	K	G	124		151	138	110
9	Alwar	Rajasthan	C	R	K	G	243	299	263	268	214
10	Ambala	Haryana	D	R	J	G	124	187	151	154	123
11	Ambikapur	Chhattisgarh	D	S	K	H	55		50	52	42
12	Amravati	Maharashtra	C	R	J	F	243	454	465	387	310
13	Amreli	Gujarat	D	R	J	F	124	187		156	124
14	Anantnag	J&K	D							31	25
15	Anantapur	Andhra Pradesh	D	R	K	G	124		151	138	110
16	Arrah	Bihar	D	S	L	H	55	43	50	49	39

17	Aurangabad	Bihar	D	S	L	H	55	43	50	49	39
18	Azamgarh	Uttar Pradesh	D	R	L	H	124	43	50	72	58
19	Budaun	Uttar Pradesh	D	R	L	H	124	43	50	72	58
20	Bagaha	Bihar	D	S	L	H	55	43	50	49	39
21	Bagalkot	Karnataka	D	R	K	F	124			124	99
22	Bahadurgarh	Haryana	D	R	J	G	124	187	151	154	123
23	Baharampur	West Bengal	C	R	K	G	243	299	263	268	214
24	Bahraich	Uttar Pradesh	D	R	L	H	124	43	50	72	58
25	Baleshwar	Orissa	D	R	L	H	124	43	50	72	58
26	Balia	Uttar Pradesh	D	R	L	H	124	43	50	72	58
27	Balurghat	West Bengal	D	R	K	G	124		151	138	110
28	Banda	Uttar Pradesh	D	R	L	H	124	43	50	72	58
29	Bangaon	West Bengal	D	R	K	G	124		151	138	110
30	Bankura	West Bengal	D	R	K	G	124		151	138	110
31	Banswara	Rajasthan	D	R	K	G	124		151	138	110
32	Barddhaman	West Bengal	C	R	K	G	243	299	263	268	214
33	Baripada	Orissa	D	R	L	H	124	43	50	72	58
34	Barnala	Punjab	D	Q	J	G		187	151	169	135
35	Barshi	Maharashtra	D	R	J	F	124	187		156	124
36	Basti	Uttar Pradesh	D	R	L	H	124	43	50	72	58
37	Beawar	Rajasthan	D	R	K	G	124		151	138	110
38	Begusarai	Bihar	D	S	L	H	55	43	50	49	39
39	Belgaum	Karnataka	C	R	K	F	243	299	465	335	268
40	Bellary	Karnataka	C	R	K	F	243	299	465	335	268
41	Bettiah	Bihar	D	S	L	H	55	43	50	49	39
42	Betul	Madhya Pradesh	D	S	L	G	55	43	151	83	66
43	Bhadrak	Orissa	D	R	L	H	124	43	50	72	58
44	Bhagalpur	Bihar	C	S	L	H	146	114	132	131	105
45	Bharatpur	Rajasthan	D	R	K	G	124		151	138	110

46	Bharuch	Gujarat	D	R	J	F	124	187		156	124
47	Bathinda	Punjab	D	Q	J	G		187	151	169	135
48	Bhavnagar	Gujarat	C	R	J	F	243	454	465	387	310
49	Bhiwani	Haryana	D	R	J	G	124	187	151	154	123
50	Bhimavaram	Andhra Pradesh	D	R	K	G	124		151	138	110
51	Bhilwara	Rajasthan	C	R	K	G	243	299	263	268	214
52	Bhuj	Gujarat	D	R	J	F	124	187		156	124
53	Bidar	Karnataka	D	R	K	F	124			124	99
54	Biharsharif	Bihar	D	S	L	H	55	43	50	49	39
55	Bijapur	Karnataka	C	R	K	F	243	299	465	335	268
56	Bokaro Steel City	Jharkhand	D	S	L	H	55	43	50	49	39
57	Botad	Gujarat	D	R	J	F	124	187		156	124
58	Brahmapur	Orissa	C	R	L	H	243	114	132	163	130
59	Burhanpur	Madhya Pradesh	D	S	L	G	55	43	151	83	66
60	Chandrapur	Maharashtra	C	R	J	F	243	454	465	387	310
61	Chapra	Bihar	D	S	L	H	55	43	50	49	39
62	Chhattarpur	Madhya Pradesh	D	S	L	G	55	43	151	83	66
63	Chhindwara	Madhya Pradesh	D	S	L	G	55	43	151	83	66
64	Chikmagalur	Karnataka	D	R	K	F	124			124	99
65	Chilakaluripet	Andhra Pradesh	D	R	K	G	124		151	138	110
66	Chirala	Andhra Pradesh	D	R	K	G	124		151	138	110
67	Chitradurga	Karnataka	D	R	K	F	124			124	99
68	Chittaurgarh	Rajasthan	D	R	K	G	124		151	138	110
69	Chittoor	Andhra Pradesh	D	R	K	G	124		151	138	110
70	Churu	Rajasthan	D	R	K	G	124		151	138	110
71	Coonoor	Tamil Nadu	D	Q	J	F		187		187	150
72	Kadapa	Andhra Pradesh	D	R	K	G	124		151	138	110
73	Dahod	Gujarat	D	R	J	F	124	187		156	124
74	Daman	Daman & Diu	D	R	J	F	124	187		156	124

75	Damoh	Madhya Pradesh	D	S	L	G	55	43	151	83	66
76	Darbhanga	Bihar	D	S	L	H	55	43	50	49	39
77	Darjiling	West Bengal	D	R	K	G	124		151	138	110
78	Dehradun	Uttarakhand	C	Q	J		667	454		560	448
79	Deoghar	Jharkhand	D	S	L	H	55	43	50	49	39
80	Deoria	Uttar Pradesh	D	R	L	H	124	43	50	72	58
81	Davanagere	Karnataka	C	R	K	F	243	299	465	335	268
82	Dhanbad	Jharkhand	B	S	L	H	790	661	723	725	580
83	Dharmavaram	Andhra Pradesh	D	R	K	G	124		151	138	110
84	Dhaulpur	Rajasthan	D	R	K	G	124		151	138	110
85	Dhulian	West Bengal	D	R	K	G	124		151	138	110
86	Dibrugarh	Assam	D	S	L	H	31	31	31	31	25
87	Dimapur	Nagaland	D	S	L	H	31	31	31	31	25
88	Dindigul	Tamil Nadu	D	Q	J	F		187		187	150
89	Durg-Bhilainagar	Chhattisgarh	D	S	K	H	55		50	52	42
90	Eluru	Andhra Pradesh	D	R	K	G	124		151	138	110
91	English Bazar (Maldah)	West Bengal	C	R	K	G	243	299	263	268	214
92	Erode	Tamil Nadu	C	Q	J	F	667	454	465	529	423
93	Etah	Uttar Pradesh	D	R	L	H	124	43	50	72	58
94	Etawah	Uttar Pradesh	D	R	L	H	124	43	50	72	58
95	Faizabad/Ayodhya	Uttar Pradesh	D	R	L	H	124	43	50	72	58
96	Farrukhabad cum Fatehgarh	Uttar Pradesh	D	R	L	H	124	43	50	72	58
97	Fatehpur	Uttar Pradesh	D	R	L	H	124	43	50	72	58
98	Firozpur	Punjab	D	Q	J	G		187	151	169	135
99	Gadag Betigeri	Karnataka	D	R	K	F	124			124	99
100	Gandhidham	Gujarat	D	R	J	F	124	187		156	124
101	Ganganagar	Rajasthan	D	R	K	G	124		151	138	110
102	Gaya	Bihar	C	S	L	H	146	114	132	131	105

103	Ghazipur	Uttar Pradesh	D	R	L	H	124	43	50	72	58
104	Giridih	Jharkhand	D	S	L	H	55	43	50	49	39
105	Godhra	Gujarat	D	R	J	F	124	187		156	124
106	Gonda	Uttar Pradesh	D	R	L	H	124	43	50	72	58
107	Gondiya	Maharashtra	D	R	J	F	124	187		156	124
108	Guna	Madhya Pradesh	D	S	L	G	55	43	151	83	66
109	Guntakal	Andhra Pradesh	D	R	K	G	124		151	138	110
110	Haldwani-cum Kathgodam	Uttarakhand	D	Q	J			187		187	150
111	Hanumangarh	Rajasthan	D	R	K	G	124		151	138	110
112	Hardoi	Uttar Pradesh	D	R	L	H	124	43	50	72	58
113	Hardwar	Uttarakhand	D	Q	J			187		187	150
114	Hassan	Karnataka	D	R	K	F	124			124	99
115	Hazaribag	Jharkhand	D	S	L	H	55	43	50	49	39
116	Hindaun	Rajasthan	D	R	K	G	124		151	138	110
117	Hindupur	Andhra Pradesh	D	R	K	G	124		151	138	110
118	Hoshiarpur	Punjab	D	Q	J	G		187	151	169	135
119	Hospet	Karnataka	D	R	K	F	124			124	99
120	Hubli-Dharwad	Karnataka	C	R	K	F	243	299	465	335	268
121	Imphal	Manipur	C	S	L	H	83	83	83	83	67
122	Itarsi	Madhya Pradesh	D	S	L	G	55	43	151	83	66
123	Jagdalpur	Chhattisgarh	D	S	K	H	55		50	52	42
124	Jamnagar	Gujarat	C	R	J	F	243	454	465	387	310
125	Jaunpur	Uttar Pradesh	D	R	L	H	124	43	50	72	58
126	Jetpur Navagadh	Gujarat	D	R	J	F	124	187		156	124
127	Jhunjhunun	Rajasthan	D	R	K	G	124		151	138	110
128	Jind	Haryana	D	R	J	G	124	187	151	154	123
129	Jorhat	Assam	D	S	L	H	31	31	31	31	25
130	Junagadh	Gujarat	D	R	J	F	124	187		156	124

131	Kaithal	Haryana	D	R	J	G	124	187	151	154	123
132	Kakinada	Andhra Pradesh	C	R	K	G	243	299	263	268	214
133	Kanhangad (Kasargod)	Kerala	D	Q	J	F		187		187	150
134	Karaikkudi	Tamil Nadu	D	Q	J	F		187		187	150
135	Karimnagar	Telangana	D	R	K	G	124		151	138	110
136	Karur	Tamil Nadu	D	Q	J	F		187		187	150
137	Kavaratti	Lakshadweep	D								5
138	Khammam	Telangana	D	R	K	G	124		151	138	110
139	Khandwa	Madhya Pradesh	D	S	L	G	55	43	151	83	66
140	Kharagpur	West Bengal	D	R	K	G	124		151	138	110
141	Khargone	Madhya Pradesh	D	S	L	G	55	43	151	83	66
142	Kishanganj	Bihar	D	S	L	H	55	43	50	49	39
143	Kohima	Nagaland	D	S	L	H	31	31	31	31	25
144	Kolar	Karnataka	D	R	K	F	124			124	99
145	Korba	Chhattisgarh	D	S	K	H	55		50	52	42
146	Kothagudem	Telangana	D	R	K	G	124		151	138	110
147	Krishnanagar	West Bengal	D	R	K	G	124		151	138	110
148	Kurnool	Andhra Pradesh	C	R	K	G	243	299	263	268	214
149	Lakhimpur	Uttar Pradesh	D	R	L	H	124	43	50	72	58
150	Lalitpur	Uttar Pradesh	D	R	L	H	124	43	50	72	58
151	Latur	Maharashtra	C	R	J	F	243	454	465	387	310
152	Ludhiana	Punjab	B	Q	J	G	1,584	1,327	799	1,237	989
153	Machilipatnam	Andhra Pradesh	D	R	K	G	124		151	138	110
154	Madanapalle	Andhra Pradesh	D	R	K	G	124		151	138	110
155	Mahbubnagar	Telangana	D	R	K	G	124		151	138	110
156	Mahesana	Gujarat	D	R	J	F	124	187		156	124
157	Mainpuri	Uttar Pradesh	D	R	L	H	124	43	50	72	58
158	Makrana	Rajasthan	D	R	K	G	124		151	138	110

159	Malegaon	Maharashtra	C	R	J	F	243	454	465	387	310
160	Mancherial	Telangana	D	R	K	G	124		151	138	110
161	Mandsaur	Madhya Pradesh	D	S	L	G	55	43	151	83	66
162	Mathura	Uttar Pradesh	D	R	L	H	124	43	50	72	58
163	Maunath Bhanjan (Distt.Mau)	Uttar Pradesh	D	R	L	H	124	43	50	72	58
164	Medini Nagar (Daltonganj)	Jharkhand	D	S	L	H	55	43	50	49	39
165	Mirzapur cum Vindhyachal	Uttar Pradesh	D	R	L	H	124	43	50	72	58
166	Moga	Punjab	D	Q	J	G		187	151	169	135
167	Moradabad	Uttar Pradesh	B	R	L	H	775	661	723	720	576
168	Motihari	Bihar	D	S	L	H	55	43	50	49	39
169	Muktsar	Punjab	D	Q	J	G		187	151	169	135
170	Munger	Bihar	D	S	L	H	55	43	50	49	39
171	Murwara (Katni)	Madhya Pradesh	D	S	L	G	55	43	151	83	66
172	Muzaffarnagar	Uttar Pradesh	C	R	L	H	243	114	132	163	130
173	Nagaon (Nowgang)	Assam	D	S	L	H	31	31	31	31	25
174	Nagercoil/Kanyakumari	Tamil Nadu	D	Q	J	F		187		187	150
175	Nagaur	Rajasthan	D	R	K	G	124		151	138	110
176	Nalgonda	Telangana	D	R	K	G	124		151	138	110
177	Nandurbar	Maharashtra	D	R	J	F	124	187		156	124
178	Nandyal	Andhra Pradesh	D	R	K	G	124		151	138	110
179	Narasaraopet	Andhra Pradesh	D	R	K	G	124		151	138	110
180	Neemuch	Madhya Pradesh	D	S	L	G	55	43	151	83	66
181	Nellore	Andhra Pradesh	C	R	K	G	243	299	263	268	214
182	Neyveli	Tamil Nadu	D	Q	J	F		187		187	150
183	Nizamabad	Telangana	C	R	K	G	243	299	263	268	214
184	Ongole	Andhra Pradesh	D	R	K	G	124		151	138	110

185	Orai	Uttar Pradesh	D	R	L	H	124	43	50	72	58
186	Osmanabad	Maharashtra	D	R	J	F	124	187		156	124
187	Palakkad	Kerala	D	Q	J	F		187		187	150
188	Palanpur	Gujarat	D	R	J	F	124	187		156	124
189	Pali	Rajasthan	D	R	K	G	124		151	138	110
190	Panipat	Haryana	D	R	J	G	124	187	151	154	123
191	Patan	Gujarat	D	R	J	F	124	187		156	124
192	Pathankot	Punjab	D	Q	J	G		187	151	169	135
193	Porbandar	Gujarat	D	R	J	F	124	187		156	124
194	Portblair	Andaman & Nicobar	D							31	25
195	Proddatur	Andhra Pradesh	D	R	K	G	124		151	138	110
196	Pudukkottai	Tamil Nadu	D	Q	J	F		187		187	150
197	Puri	Orissa	D	R	L	H	124	43	50	72	58
198	Purnia	Bihar	C	S	L	H	146	114	132	131	105
199	Puruliya	West Bengal	D	R	K	G	124		151	138	110
200	Rae Bareli	Uttar Pradesh	D	R	L	H	124	43	50	72	58
201	Raichur	Karnataka	D	R	K	F	124			124	99
202	Raiganj	West Bengal	D	R	K	G	124		151	138	110
203	Raigarh	Chhattisgarh	D	S	K	H	55		50	52	42
204	Rajapalayam	Tamil Nadu	D	Q	J	F		187		187	150
205	Ramagundam	Telangana	D	R	K	G	124		151	138	110
206	Ratlam	Madhya Pradesh	D	S	L	G	55	43	151	83	66
207	Rewa	Madhya Pradesh	D	S	L	G	55	43	151	83	66
208	Rewari	Haryana	D	R	J	G	124	187	151	154	123
209	Rohtak	Haryana	D	R	J	G	124	187	151	154	123
210	Sagar	Madhya Pradesh	C	S	L	G	146	114	263	174	140
211	Saharanpur	Uttar Pradesh	C	R	L	H	243	114	132	163	130

212	Saharsa	Bihar	D	S	L	H	55	43	50	49	39
213	Salem	Tamil Nadu	C	Q	J	F	667	454	465	529	423
214	Sambalpur	Orissa	D	R	L	H	124	43	50	72	58
215	Sasaram	Bihar	D	S	L	H	55	43	50	49	39
216	Satna	Madhya Pradesh	D	S	L	G	55	43	151	83	66
217	Sawai Madhopur	Rajasthan	D	R	K	G	124		151	138	110
218	Seoni	Madhya Pradesh	D	S	L	G	55	43	151	83	66
219	Shahjahanpur	Uttar Pradesh	C	R	L	H	243	114	132	163	130
220	Shikohabad	Uttar Pradesh	D	R	L	H	124	43	50	72	58
221	Shimoga	Karnataka	C	R	K	F	243	299	465	335	268
222	Shivpuri	Madhya Pradesh	D	S	L	G	55	43	151	83	66
223	Sikar	Rajasthan	D	R	K	G	124		151	138	110
224	Silchar	Assam	D	S	L	H	31	31	31	31	25
225	Singrauli	Madhya Pradesh	D	S	L	G	55	43	151	83	66
226	Sirsa	Haryana	D	R	J	G	124	187	151	154	123
227	Sitamarhi	Bihar	D	S	L	H	55	43	50	49	39
228	Sitapur	Uttar Pradesh	D	R	L	H	124	43	50	72	58
229	Siwan	Bihar	D	S	L	H	55	43	50	49	39
230	Srikakulam	Andhra Pradesh	D	R	K	G	124		151	138	110
231	Sujangarh	Rajasthan	D	R	K	G	124		151	138	110
232	Sultanpur	Uttar Pradesh	D	R	L	H	124	43	50	72	58
233	Surendranagar Dudhrej	Gujarat	D	R	J	F	124	187		156	124
234	Suryapet	Andhra Pradesh	D	R	K	G	124		151	138	110
235	Tadpatri	Andhra Pradesh	D	R	K	G	124		151	138	110
236	Tezpur	Assam	D	S	L	H	31	31	31	31	25
237	Thanesar	Haryana	D	R	J	G	124	187	151	154	123
238	Thanjavur	Tamil Nadu	D	Q	J	F		187		187	150
239	Tinsukia	Assam	D	S	L	H	31	31	31	31	25

240	Tiruvannamalai	Tamil Nadu	D	Q	J	F		187		187	150
241	Tonk	Rajasthan	D	R	K	G	124		151	138	110
242	Tumkur	Karnataka	D	R	K	F	124			124	99
243	Udgir	Maharashtra	D	R	J	F	124	187		156	124
244	Udupi	Karnataka	D	R	K	F	124			124	99
245	Ujjain	Madhya Pradesh	C	S	L	G	146	114	263	174	140
246	Vaniyambadi	Tamil Nadu	D	Q	J	F		187		187	150
247	Vellore	Tamil Nadu	C	Q	J	F	667	454	465	529	423
248	Veraval	Gujarat	D	R	J	F	124	187		156	124
249	Vidisha	Madhya Pradesh	D	S	L	G	55	43	151	83	66
250	Vizianagaram	Andhra Pradesh	D	R	K	G	124		151	138	110
251	Wadhwan (Surendernagar)	Gujarat	D	R	J	F	124	187		156	124
252	Wardha	Maharashtra	D	R	J	F	124	187		156	124
253	Yavatmal	Maharashtra	D	R	J	F	124	187		156	124

Annexure XIII

Strength of relationship between the three sets of the data generated by indexing of the States based on per capita GSDP, per capita GR and density of FM Radio receivers using Spearman's Rank Correlation Coefficient

S.No.	State	Per Capita GR Rank (r1)	Density of FM Radio receivers Rank (r2)	Per Capita GSDP Rank (r3)	*d12 = r1 - r2*	*d23 = r2 - r3*	*d31 = r3 - r1*	*square (d12)*	*square (d23)*	*square (d31)*
1	Andhra Pradesh	6	11	9	-5	2	3	25	4	9
2	Bihar	18	20	20	-2	0	2	4	0	4
3	Chhattisgarh	14	18	13	-4	5	-1	16	25	1
4	Gujarat	5	8	3	-3	5	-2	9	25	4
5	Haryana	8	9	1	-1	8	-7	1	64	49
6	Himachal Pradesh	11	1	7	10	-6	-4	100	36	16
7	J&K	13	14	14	-1	0	1	1	0	1
8	Jharkhand	15	19	17	-4	2	2	16	4	4
9	Karnataka	2	6	10	-4	-4	8	16	16	64
10	Kerala	4	4	4	0	0	0	0	0	0
11	Madhya Pradesh	12	17	18	-5	-1	6	25	1	36
12	Maharashtra	1	7	2	-6	5	1	36	25	1
13	NE	19	16	16	3	0	-3	9	0	9
14	Odisha	17	13	15	4	-2	-2	16	4	4
15	Punjab	7	3	6	4	-3	-1	16	9	1
16	Rajasthan	10	12	11	-2	1	1	4	1	1
17	Tamil Nadu	3	2	8	1	-6	5	1	36	25
18	Uttar Pradesh	16	15	19	1	-4	3	1	16	9
19	WB	9	10	12	-1	-2	3	1	4	9
							$\sum d^2$	297	270	247

Calculation of Spearman's Rank Correlation Coefficient

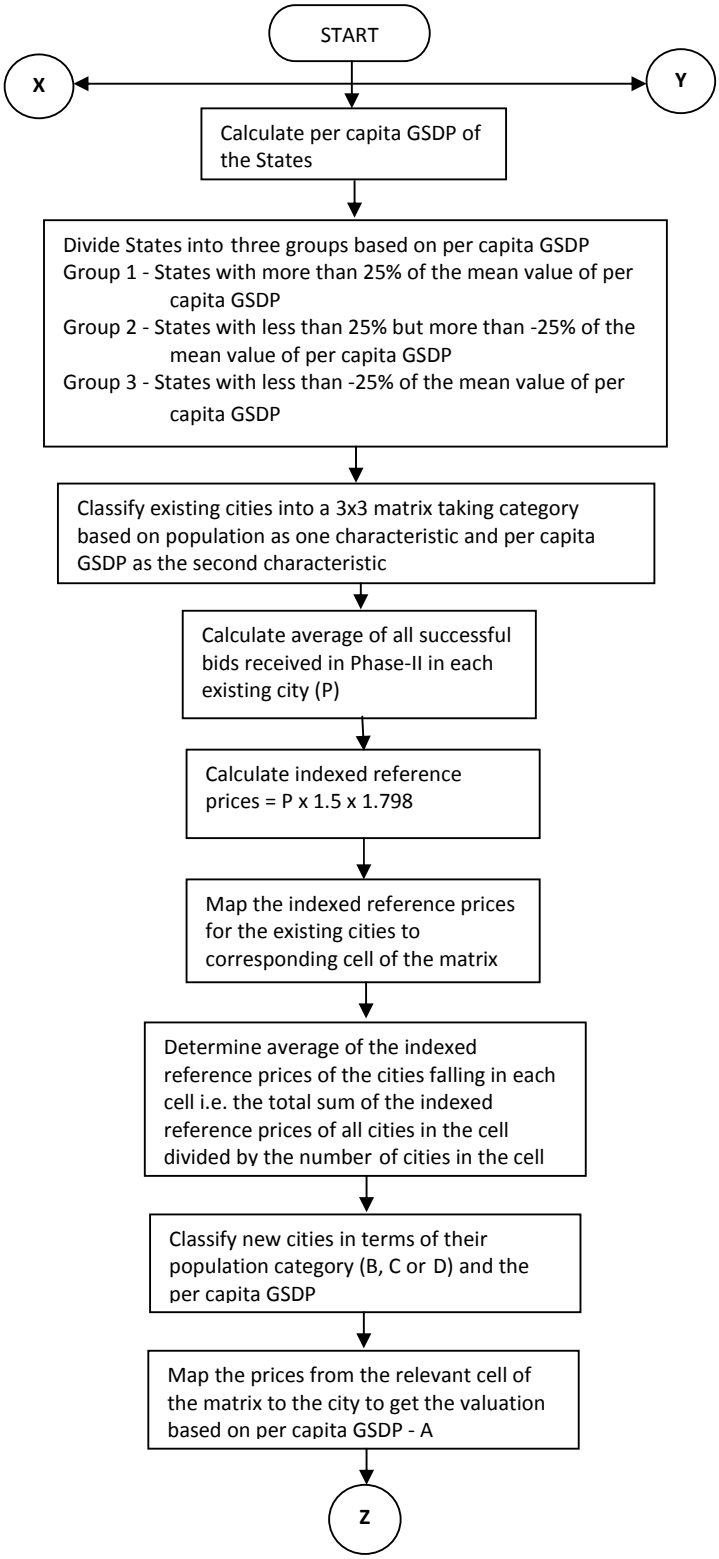
n	23
n^3	12167
n^3 - n	12144

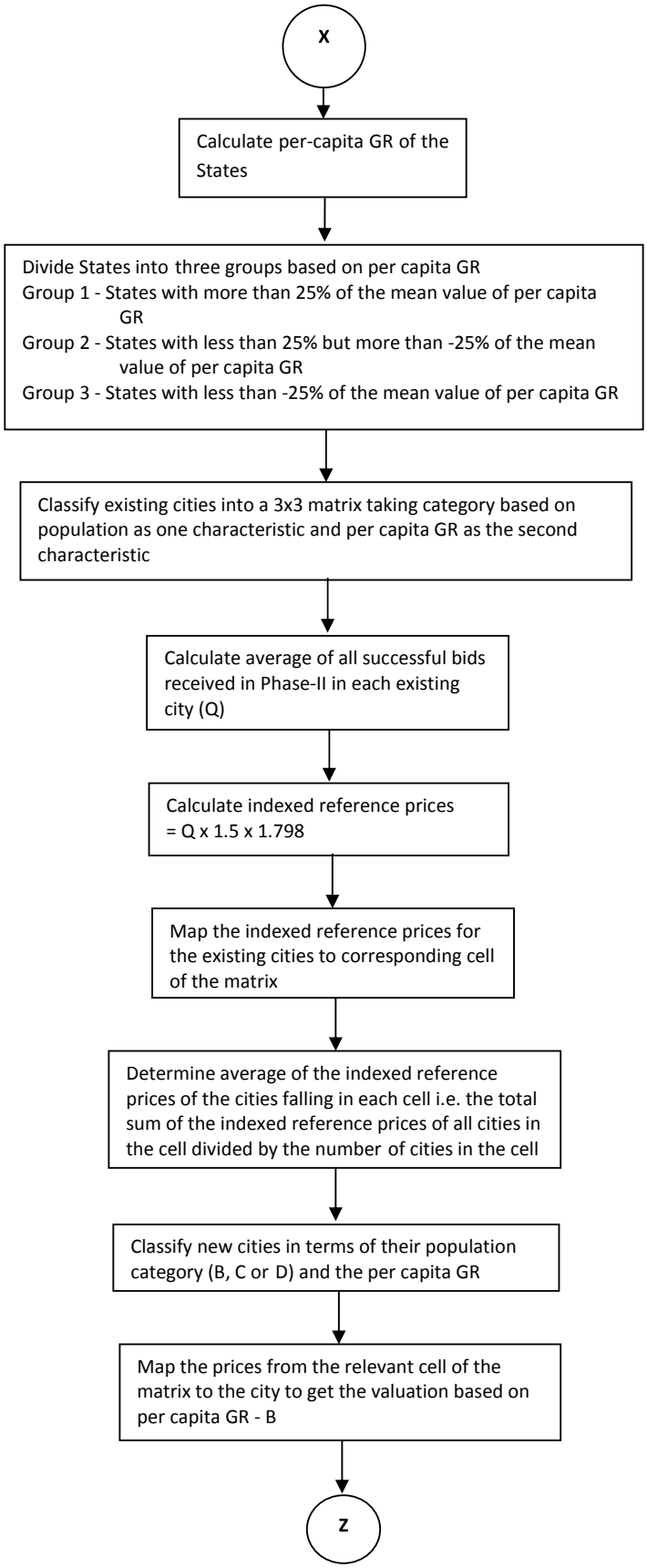
$$r_s = 1 - \frac{6(\sum d^2)}{n(n^2-1)}$$

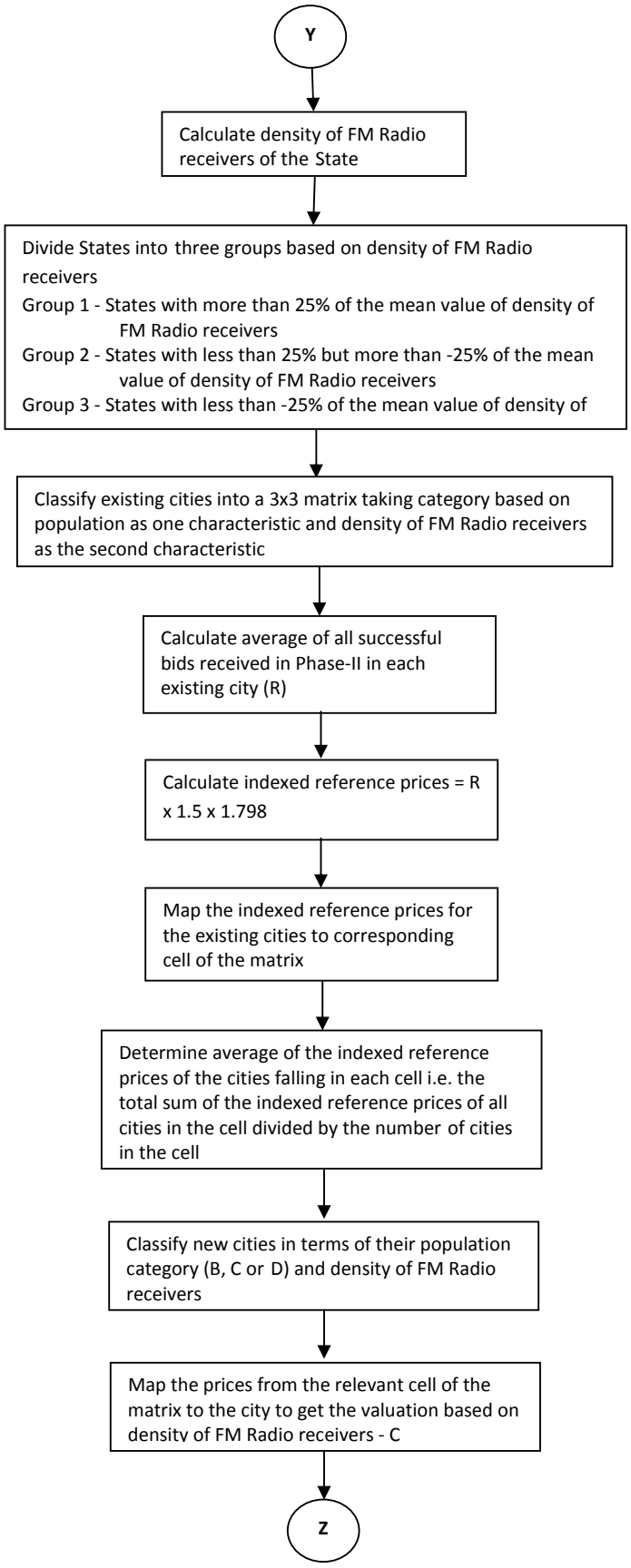
rs13	0.8533
rs23	0.8666
rs31	0.8780

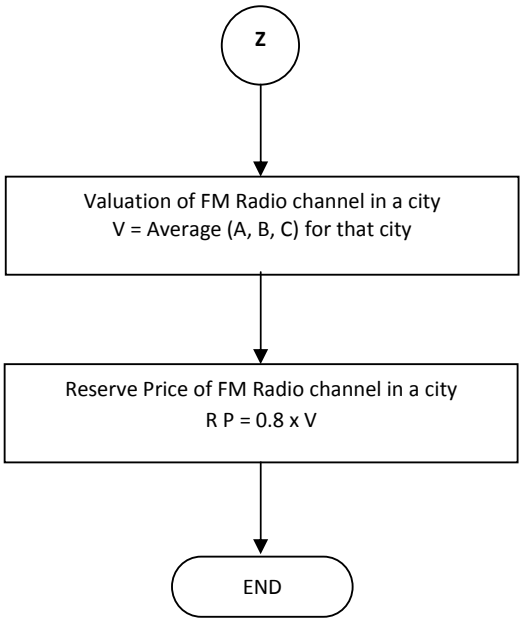
Annexure XIV

Methodology for determination of RP for FM Radio channels in new cities




X
Calculate per-capita GR of the States
Divide States into three groups based on per capita GR
Group 1 - States with more than 25% of the mean value of per capita GR
Group 2 - States with less than 25% but more than -25% of the mean value of per capita GR
Group 3 - States with less than -25% of the mean value of per capita GR
Classify existing cities into a 3x3 matrix taking category based on population as one characteristic and per capita GR as the second characteristic
Calculate average of all successful bids received in Phase-II in each existing city (Q)
Calculate indexed reference prices = Q x 1.5 x 1.798
Map the indexed reference prices for the existing cities to corresponding cell of the matrix
Determine average of the indexed reference prices of the cities falling in each cell i.e. the total sum of the indexed reference prices of all cities in the cell divided by the number of cities in the cell
Classify new cities in terms of their population category (B, C or D) and the per capita GR
Map the prices from the relevant cell of the matrix to the city to get the valuation based on per capita GR - B
Z


Y
Calculate density of FM Radio receivers of the State
Divide States into three groups based on density of FM Radio receivers
Group 1 - States with more than 25% of the mean value of density of FM Radio receivers
Group 2 - States with less than 25% but more than -25% of the mean value of density of FM Radio receivers
Group 3 - States with less than -25% of the mean value of density of
Classify existing cities into a 3x3 matrix taking category based on population as one characteristic and density of FM Radio receivers as the second characteristic
Calculate average of all successful bids received in Phase-II in each existing city (R)
Calculate indexed reference prices = R x 1.5 x 1.798
Map the indexed reference prices for the existing cities to corresponding cell of the matrix
Determine average of the indexed reference prices of the cities falling in each cell i.e. the total sum of the indexed reference prices of all cities in the cell divided by the number of cities in the cell
Classify new cities in terms of their population category (B, C or D) and density of FM Radio receivers
Map the prices from the relevant cell of the matrix to the city to get the valuation based on density of FM Radio receivers - C
Z


Z
Valuation of FM Radio channel in a city
V = Average (A, B, C) for that city
Reserve Price of FM Radio channel in a city
R P = 0.8 x V
END